ASTRONAUTICS INFORMATION

RADIOMETRY AND PHOTOMETRY OF THE MOON AND PLANETS

LITERATURE SEARCH NO. 345

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JET PROPULSION LABORATORY

CALIFORNIA INSTITUTE OF TECHNOLOGY, PASADENA, CALIFORNIA

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[8]

~~COMPILED BY~~
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(JPL-AI/LS-345)

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CALIF~~ORNIA~~ INST~~ITUTE~~ OF TECH~~NOLOGY~~
PASADENA ~~CALIFORNIA~~

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FOREWORD

This compilation has been prepared at the request of scientific personnel at the Jet Propulsion Laboratory (JPL), and is published for distribution to interested organizations working in the field of astronautics.

Material has been collected on photometry, spectrophotometry, colorimetry, and other methods of studying the surfaces and atmospheres of the planets in the visual, ultraviolet, and infrared regions. The material is divided into nine sections covering the major planets, the Moon, and lunar eclipses. A general section contains survey articles and some selected references on instrumentation. An author index is included.

In each section, with the exception of "Lunar Eclipses," the material is divided into books, reports and periodicals. Books are arranged in alphabetical order by author, and reports in alphabetical order by source. Beginning with the most recent articles, periodicals are listed in chronological order by year, and within each year in alphabetical order by journal. "Lunar Eclipses" is arranged in chronological order by date of eclipse, with the most recent eclipse appearing first. Abstracts found in the reference source are published here in whole or in part, and the source is noted whenever possible. Entries referenced from the *Astronomischer Jahresbericht* have been translated from the German.

The following sources have been consulted:

JPL Subject Index, through August 1961
JPL Astronautics Information/Abstracts (AI/A), through June 1961
JPL Astronautics Information/Survey (AI/S), through June 1961
Applied Science & Technology Index (AS&T), 1958–June 1961
Physics Abstracts (PA), 1960
Engineering Index (EI), 1955–1959
Astronomischer Jahresbericht (AJ), 1925–1958

The compiler wishes to acknowledge the assistance of Justin J. Rennilson and Dorris M. Wallenbrock in the selection and translation of material.

CONTENTS

GENERAL

Books

1. INVESTIGATIONS OF THE PHYSICAL PROPERTIES OF THE MOON AND THE PLANETS
Barabashov, N. P.
Kharkov, University of, USSR, 1952 (in Russian)
(*AJ*, 1952, #7002)

2. A MULTIPLEX PHOTOELECTRIC SPECTROPHOTOMETER
Braddick, H. J. J., Wilcock, W. L.
In "Proceedings of a Symposium on Astronomical Optics and Related Subjects," University of Manchester, Great Britain, April 19–22, 1956, Kopal, Z., Editor
North Holland Publishing Co., Amsterdam, 1956
(*AJ*, 1956, #2227)

3. HANDBUCH DER ASTROPHYSIK
Eberhard, G., et al., Editors
Springer-Verlag, Berlin, 1929, Vol. II/1

The following chapters are included in this book: "Theoretische Photometrie," E. Schoenberg; "Visuelle Photometrie," W. Hassenstein; "Photographische Photometrie," G. Eberhard; "Spektrophotometrie," A. Brill; "Lichelektrische Photometrie," H. Rosenberg.

4. EXPLORING THE PLANETS
Gallant, R. A.
Garden City Books, Doubleday and Company, Inc., Garden City, N. Y., 1958
(*AJ*, 1958, #7009)

5. ZUR TECHNIK DER PHOTOGRAPHISCHEN PHOTOMETRIE DER PLANETEN-OBERFLÄCHEN (THE TECHNIQUE OF PHOTOGRAPHIC PHOTOMETRY OF PLANETARY SURFACES)
Gramatzki, H. J.
Dummler, F., Berlin and Bonn, 1937
(*AJ*, 1937, #5105)

An investigation is made of the influence of atmospheric disturbances on the quality of the photographs as a function of lens aperture and gradation of the plates. The relationship of the image area of the object to the undisturbed and atmospherically disturbed diffraction discs is used as a measure of absolute and relative performance. It is found that with respect to the relative performance the small lens apertures are superior to the large ones and that it is possible to counteract a part of the disturbance—the longitudinal irregularities in the photographs—by using plates with steep gradation.

A mirror with a specially devised Barlow lens in front of the Newton focus is used as the instrument. The author recommends—and also uses—an anamorphotic system whose purpose it is to enlarge the pictures only in the direction in which they are later to be scanned photometrically. This one-dimensional enlargement results in more favorable exposure times, as these increase linearly with the picture scale. A neutral [Goldberg] wedge is used to produce the density scales on the plate. However, as this method does not appear to be satisfactory because of the selective absorption of the wedge and the small diameter of the pictures, the author develops a new shading method.

6. FLAGSTAFF PHOTOELECTRIC CONFERENCE
Irwin, J. B., Editor
Indiana University Press, Bloomington, 1953

7. THE NATURE OF THE PLANETS
Sharonov, V. V.
Physics-Mathematics State Publisher, Moscow, 1958
(*AJ*, 1958, #7022)

8. HANDBUCH DER EXPERIMENTALPHYSIK
Wien, W., Harms, F., Editors
Akademische Verlagsgesellschaft M.B.H., Leipzig, Germany, 1937, Vol. 26

9. ASTRONOMICAL PHOTOELECTRIC PHOTOMETRY
Wood, F. B., Editor
Symposium of the American Association for the Advancement of Science, Philadelphia, Pa., December 31, 1951
American Association for the Advancement of Science, Washington, D.C., 1953

Reports

10. PLANETARY ASTRONOMY FROM SATELLITE SUBSTITUTE VEHICLES. PART II. A SURVEY OF PHYSICAL PROBLEMS OF THE NEARER PLANETS AND A REVIEW OF OBSERVATIONAL TECHNIQUES APPLICABLE TO BALLOON-BORNE TELESCOPE SYSTEMS
de Vaucouleurs, G.
December 1959
Air Force Missile Development Center, Holloman Air Force Base, N. Mex.
AFMDC-TN-59-37
AD-233,561

11. APPLICATION OF TELEVISION TECHNIQUES IN ASTRONOMY
Baum, W. A.
Paper presented at the 91st AAS Meeting, Ann Arbor, Mich., June 20–23, 1954
American Astronomical Society, Inc., New York, N.Y.

This is a discussion of the two major areas of technological progress which have been responsible for most of the modern advances in observational astronomy: (1) the building of bigger telescopes to gather more light; and (2) the enormous improvement of light receivers, namely, photographic emulsions and photoelectric instruments.

12. INFRARED OBSERVATIONS OF PLANETS AND SATELLITES
Kuiper, G. P.
Paper presented at the 98th AAS Meeting, Urbana, Ill., August 18–21, 1957
American Astronomical Society, Inc., New York, N.Y.
(Abstracted in *Astronomical Journal*, v. 62, no. 8, p. 245, 1957)

13. A PRELIMINARY PHOTOMETRIC ATLAS OF THE SOLAR ULTRAVIOLET SPECTRUM FROM 1800 TO 2965 ANGSTROMS
McAllister, H. C.
1960
Colorado, University of, Physics Dept., Boulder
Atlas, AF 19(604)–2181

14. THE KNOWN PHYSICAL CHARACTERISTICS OF THE MOON AND THE PLANETS
Kiess, C. C., Lassovzsky, K.
July 1958
Georgetown College Observatory, Ky.
Monograph 12, ARDC-TR-58-41, AF 18(600)-1770
AD-115, 617

The physical characteristics of the Moon, Mercury, Venus, and Mars are described in detail. The known dimensions, masses, and densities are listed. The presence and composition of an atmosphere on each of these bodies is discussed and the planetary surfaces are described in terms of the available observational evidence. Details of significant scientific investigations are included throughout and show the development of modern ideas from early theories.

15. MULTICOLOR PHOTOELECTRIC PHOTOMETRY OF THE MOON, VENUS, MARS AND OTHER PLANETS
December 1960
Harvard University, Harvard College Observatory, Cambridge, Mass.
Semiannual Status Report 1, NsG-89-60

The report is chiefly devoted to equipment problems, such as selection of filters and photocells and design of the photometer heads.

16. RESULTS OF PHOTOMETRIC OBSERVATIONS OF THE MOON AND PLANETS AT THE ASTRONOMICAL OBSERVATORY OF KHARKOV UNIVERSITY
Barabashov, N. P.
1957
Kharkov, University of, USSR
Thesis (in Russian)

17. A LOW RESOLUTION UNCHOPPED RADIOMETER FOR SATELLITES
Hanel, R. A.
February 1961
National Aeronautics and Space Administration, Goddard Space Flight Center, Washington, D.C.
NASA TN-D-485

The black-body temperature and the albedo of a planet, and the variation of both parameters with latitude,

longitude, and time, are of great value in understanding the climatic and meteorological conditions of the planet. An unchopped radiometer with a wide, but restricted, field of view is capable of such temperature and albedo measurements. Coated thermistors mounted in highly reflective cones serve as detectors. Their performance as sensor elements is analyzed in detail herein to prove the feasibility of the measurement. The simplicity of the instrumentation and the low information bandwidth required make the experiment equally attractive for Earth satellites and space probes.

18. **STUDIES OF THE PHYSICAL PROPERTIES OF THE MOON AND PLANETS**
Davis, M. H., Compiler and Editor
December 31, 1960
Rand Corp., Santa Monica, Calif.
RM-2711-JPL, N-33561, NASw-6

A major fraction of the Rand research effort during the second quarter centered on studies pertinent to the scientific instrumentation to be carried on the first Venus space probe. In addition, research is reported in more general studies of the physical characteristics and environments of the near planets.

19. **STUDIES OF THE PHYSICAL PROPERTIES OF THE MOON AND PLANETS**
Davis, M. H., Compiler and Editor
April 28, 1961
Rand Corp., Santa Monica, Calif.
RM-2769-JPL

Periodicals

20. **THE ASTROMETRIC PROGRAM AT SYDNEY OBSERVATORY**
Wood, H.
***Astronomical Journal*, v. 65, no. 4, pp. 189–193, May 1960**

A description is given of work on Sydney and Melbourne Astrographic Catalogs on minor planets and double stars, and on preparation of zone catalogs. Errors of photographic astrometry are discussed, and the conclusion is reached that the one most urgently in need of reduction is plate error. (*PA*, 1960, #12296)

21. **A NOTE ON THE "EFFECTIVE GREYSPHERE TEMPERATURE" AND "EFFECTIVE BOLOMETRIC ALBEDO" OF PLANETARY BODIES**
Firsoff, V. A.
***British Astronomical Association, Journal of the*, v. 70, no. 3, pp. 131–135, March 1960**

22. **PHOTO-ELECTRIC IMAGE TECHNIQUES IN ASTRONOMY**
Somes-Charlton, B. V.
***British Institution of Radio Engineers, Journal of the*, v. 19, pp. 417–435, July 1959**

Television techniques in detection of threshold and extremely low-level stellar and planetary images are described and achievements to date summarized. Photographs of the Moon and Mars illustrate results obtained by the low-light-level television system. (*EI*, 1959)

23. **VISUAL PHOTOMETER FOR STUDYING THE EARTH-LIGHT ON THE MOON**
Rösch, J.
***Revue d'optique*, v. 37, no. 9, pp. 458–466, September 1958 (in French)**

The design incorporates a novel beam-splitting device, which, in conjunction with an adjustable neutral wedge and rotating prism, enables the shadow area of the Moon's image to be placed in juxtaposition with an image of the bright portion of the lunar disc whose brightness may be varied. From the position of the neutral wedge when these two images are matched and read on a calibrated scale, the difference of magnitude between the bright and dark portions of the lunar image may be determined to an accuracy of $\sim$ 0.01 mag. (*PA*, 1959, #3033)

24. **ATMOSPHERES OF OTHER PLANETS**
Hess, S. L.
***Science*, v. 128, pp. 809–814, 1958**
(*AJ*, 1958, #7011)

A series of results of investigations of the atmospheres of the planets Venus, Mars, and Jupiter are compiled, and the problems still existing are indicated.

25. FILTER TECHNIQUES FOR PLANETARY OBSERVERS
Capen, C. F., Jr.
Sky and Telescope, v. 17, pp. 517, 519–520, 1958
(*AJ*, 1958, #2047)

26. NONLINEAR COLOUR CORRECTIONS IN PHOTOMETRY
Cousins, A. W. J.
Astronomical Society of South Africa, Monthly Notices of the, v. 16, pp. 111–113, 1957
(*AJ*, 1957, #2241)

27. PHOTOELECTRIC PHOTOMETRY OF CELESTIAL OBJECTS
Tremko, J.
Časopis Československých ustavů astronomických, Prague, v. 7, pp. 61–64, 1957 (in Czechoslovakian)
(*AJ*, 1957, #2281)

28. CURRENT INTEGRATOR FOR ASTRONOMICAL PHOTOELECTRIC PHOTOMETRY
Weitbrecht, R. H.
Review of Scientific Instruments, v. 28, pp. 883–888, November 1957

Instruments described are integrator circuit with programmer and timer for measuring signal current from photomultiplier, and chart pen recorder. Current range is from 10^{-6} to 10^{-11} amp; any number of identical integrator units can be employed to measure a like number of separate phototube currents simultaneously over a given timed run. Application in simultaneous multicolor photometry is described. (*EI*, 1958)

29. POLARIZATION DE LA LUMIÈRE RENVOYÉE PAR LES CORPS SOLIDES ET LES NUAGES NATURELS (POLARIZATION OF THE LIGHT REFLECTED BY SOLID BODIES AND NATURAL CLOUDS)
Dollfus, A.
Annales d'astrophysique, v. 19, pp. 83–113, 1956
(*AJ*, 1956, #224)

The polarization of light reflected from an illuminated body depends not only on the illuminating angle and the observation angle, but also on the nature of the surface. These investigations are of significance in the interpretation of observations of planets, the Moon, and the minor planets.

30. PHOTOMÈTRE À FRANGES POUR MESURER LES DIFFÉRENTES RÉGIONS D'UN OBJECT OBSERVÉ DANS UNE LUNETTE (FRINGE PHOTOMETRY FOR MEASURING THE DIFFERENT REGIONS OF AN OBJECT OBSERVED THROUGH A TELESCOPE)
Dollfus, A.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 243, pp. 1833–1835, 1956
(*AJ*, 1956, #2231)

The operation is described of a visual polarization photometer which allows the brightness of discrete areas of a planet to be measured. Mars is extensively observed with this instrument at the Pic du Midi (with the 60-cm refractor at a magnification of 800). In addition, the instrument makes possible a comparison of the brightness, and finally, the photometer can establish the relationship between planetary and stellar brightness. In the laboratory, an accuracy to a few tenths of a percent is attained with visual photometry of photographs.

31. PHOTOMÈTRE À DOUBLE IMAGE POUR COMPARER LES TACHES DE LA SURFACE D'UNE PLANÈTE (DOUBLE IMAGE PHOTOMETRY FOR COMPARING THE SPOTS ON THE SURFACE OF A PLANET)
Dollfus, A.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 243, pp. 2023–2025, 1956
(*AJ*, 1956, #2232)

A photometer is described which allows a visual brightness comparison of several areas of a planet's disc to be made directly with a telescope.

32. AN ASTRONOMICAL PHOTOELECTRIC SPECTROPHOTOMETER
Wilcock, W. L., Geake, J. E.
Observatory, v. 76, pp. 165–166, 1956
(*AJ*, 1956, #2258)

33. PHOTOMÉTRIE ABSOLUE POUR GRANDS RAPPORTS D'INTENSITÉ (ABSOLUTE PHOTOMETRY FOR LARGE INTENSITY RATIOS)
Link, F.
Revue d'optique, v. 35, pp. 129–135, 1956
(*AJ*, 1956, #2248)

A visual photometer for the absolute determination of the intensity ratio between the Sun and weak light sources, such as stars, planets, night-sky light, etc., is built using a system consisting of a photometer wedge, diffusers, lenses, color filters, and reference light sources. The photometer is constructed so that the parts of the apparatus can be interchanged and moved at right angles, depending upon the requirements of day or night observation. The measurement uncertainty [standard deviation] should be 1% at a value of 10 mag.

34. ON SOME NEW AUXILIARY INSTRUMENTS IN ASTROPHYSICAL RESEARCH
Öhman, Y.
Stockholms Observatorium, Annaler, v. 19, no. 4, pp. 3–14, 1956

New photometric devices and accessories described include the following: a birefringent filter for the CaII coronal line at 3968 Å, an experimental solar monochromator based on the selective magnetic rotation of light passing through a gas confined between crossed polarizers, and a new quadruple-image prism for solar polarization studies. (*PA*, 1960, #3031)

35. THE SCATTERING OF LIGHT THROUGH THE ATMOSPHERES OF THE PLANETS
Ambarzumian, V. A.
Von Kourganoff, V., Translator
Contributions du laboratoire d'astronomie de Lille, no. 3, pp. 15–28, 1955 (Translated from German to French)

36. DIE UMOWSCHE METHODE UND IHRE ANWENDUNG AUF DIE UNTERSUCHUNG DER PLANETENOBERFLÄCHEN (THE UMOW METHOD AND ITS APPLICATION TO THE STUDY OF PLANETARY SURFACES)
Lipski, Yu. N.
Moscow Universitet, Gosudarstvennyyi astronomicheskii institut imeni P. K. Shternberga, Trudy, no. 96, pp. 25–35, 1955 (in Russian)
(*AJ*, 1955, #2410)

In the years 1905, 1909, and 1912, Umow made some suggestions in the *Physikalische Zeitschrift* for the study of the surfaces of the Moon and the planets by analysis of polarized light. These suggestions are in no way inferior in perceptiveness to the methods currently in use and make possible a comprehensive analysis of the celestial bodies which cause light diffusion.

37. PHOTOMETRIC INVESTIGATION OF THE NATURE OF THE PLANETS AND SATELLITES
Sharonov, V. V.
Akademiia nauk SSSR, Uspekhi astronomicheskikh nauk, v. 6, pp. 181–249, 1954 (in Russian)
(*AJ*, 1954, #7021)

Contents of this monograph include: Introduction (the characteristic magnitudes of reflectivity, measurement of reflectivity in the laboratory and in nature, and some results of photometric investigations of natural surfaces); Integral Photometry of the Planets and the Moons (the brightness of the planets and their measurement, the albedo concept for spherical heavenly bodies, spectrophotometry and colorimetry of planetary light, results of photometry of the major and minor planets and of the moons, and theoretical and practical determination of the spherical albedo); Photometry of Planetary Discs (remarks on the technique of comparing brightnesses on stellar discs, technique of absolute calibration of the brightness measurements, surface photometry of the Moon, investigation of the Moon's surface by means of colorimetric and spectrophotometric methods, and conclusions concerning the surface photometry of the major planets); and Bibliography.

38. THE THEORY OF LIGHT SCATTERING IN PLANETARY ATMOSPHERES
Sobolev, V. V.
Akademiia nauk SSSR, Uspekhi astronomicheskikh nauk, v. 6, pp. 250–280, 1954 (in Russian)
(*AJ*, 1954, #7023)

The contents of this paper are: (1) presentation of the problem, (2) methods of solution, (3) the Ambarzumian method, (4) some generalizations, (5) the albedo of the medium, (6) the luminescence of the medium in the presence of a radiation-reflecting surface, (7) approximation formulas for the brightness coefficients, (8) some applications of the theory, and (9) literature.

39. PHOTOMETRICS IN ASTRONOMY
Moon, P., Spencer, D. E.
Franklin Institute, Journal of the, v. 258, no. 6, pp. 461–467, December 1954

Recent growth of astrophysics emphasizes differences that exist between the photometric nomenclature of physics and that of astronomy; astronomers employ such concepts as "brightness," "luminosity," and "magnitude," but these words are used with entirely different meanings by physicists; photometric concepts of the two groups can be correlated and made more precise. (*EI*, 1955)

40. ASTRONOMICAL PHOTOMETER
Instruments and Automation, v. 27, p. 438, 1954
(*AJ*, 1954, #2248)

41. GENERAL THEORY OF THE OPTICAL AND PHOTOGRAPHIC VISIBILITY OF DETAILS OF A PLANETARY DISC
Sharonov, V. V.
Leningrad Universitet, Vestnik, v. 9, no. 11, pp. 33–46, 1954 (in Russian)
(*AJ*, 1954, #7072)

42. PROBLEME DER PHOTOGRAPHISCHEN UND LICHTELEKTRISCHEN PHOTOMETRIE (PROBLEMS OF PHOTOGRAPHIC AND PHOTOELECTRIC PHOTOMETRY)
Behr, A.
Mitteilungen der astronomischen Gesellschaft, pp. 61–73, 1954
(*AJ*, 1955, #2247)

43. EINE EINFACHE UND GENAUE SPANNUNGSSTABILISIERUNGSMETHODE FÜR GLEICHSTROMKOMPENSATIONS—PHOTOMETER (A SIMPLE AND ACCURATE VOLTAGE-STABILIZATION METHOD FOR DIRECT-CURRENT-COMPENSATING PHOTOMETERS)
Sauer, M.
Optik, v. 11, pp. 18–21, 1954
(*AJ*, 1954, #2230)

A very simple and accurate photoelectric compensating photometer is described. The slight sensitivity to changes in voltage is achieved by means of extending the compensation to changes in cell amplification, which can quite accurately be represented as linear elements of the voltage fluctuations. The circuit scheme for gas-filled cells is of particular significance. For these cells, an increase in accuracy by a factor of ten was measured.

44. PROBLEME DER PHOTOGRAPHISCHEN UND LICHTELEKTRISCHEN ASTROPHOTOMETRIE (PROBLEMS OF PHOTOGRAPHIC AND PHOTOELECTRIC ASTROPHOTOMETRY)
Behr, A.
Physikalische Verhandlungen, v. 5, p. 138, 1954
(*AJ*, 1954, #2202)

45. A SIX-COLOR PHOTOELECTRIC PHOTOMETER
Hardie, R.
Astronomical Journal, v. 58, p. 40, 1953
(*AJ*, 1953, #2219)

46. THE EFFECT OF THE ATMOSPHERE ON THE OBSERVED DIAMETERS OF THE PLANETS AND MOONS
Sharonov, V. V.
Astronomicheskii Tsirkuliar, no. 142, pp. 3–5, 1953 (in Russian)
(*AJ*, 1953, #7024)

The geodetic radius is increased very little by refraction, but considerably more by absorption. The origin of the shadow edge during eclipses is complicated. The work of V. F. Chistiakov and V. M. Chernov is refuted.

47. A VISUAL COLORIMETRIC COMPARISON OF THE PLANETS TO THE SUN
Sharonov, V. V.
Astronomicheskii Zhurnal, v. 30, pp. 532–539, 1953 (in Russian)
(*AJ*, 1953, #7023)

A Rosenberg photometer with a blue wedge and an attachment for direct solar contact was used to obtain the following values of color index variation (extrafocal planet minus the Sun): Moon 0.329; Venus 0.090 (independent of phase angle); Mars 1.20; Jupiter 0.138; Saturn 0.37; and solar corona 0.039 (during the eclipses of 1941, 1945 and 1952). All of the values are positive, which indicates a reddening. Theoretical accuracy of the methods is given as $\pm$ 0.002 mag and practical accuracy as 0.03 mag. Variations in atmospheric conditions were considered.

48. COLOR PHOTOGRAPHY OF THE MOON AND THE PLANETS
Barabashov, N. P.
Astronomicheskii Tsirkuliar, no. 127, pp. 9–10, 1952 (in Rusian)
(*AJ*, 1952, #7331)

The first attempts are reported briefly.

49. POLARIMETRIC STUDY OF THE LIGHT OF THE PLANETS
Focas, J. E.
National Observatory of Athens, Bulletin of the Astronomical Institute, (2), pp. 28–29, 1952
(*AJ*, 1954, #7413)

The results are given of polarization measurements on Venus and Mars in 1952, performed with a Lyot polarimeter at the 16-in. refractor of the Athens Observatory.

50. DE POLARISATIE VAN HET LICHT DER PLANETEN EN KOMETEN (POLARIZATION OF THE LIGHT OF PLANETS AND COMETS)
Minnaert, M. G. J.
Nederlandsch tijschrift voor natuurkunde, v. 18, pp. 1–6, 1952
(*AJ*, 1952, #7017)

51. PHOTOGRAPHIC SPECTROPHOTOMETRY OF VENUS, MARS, JUPITER, AND SATURN
Barabashov, N. P., Chekirda, A. T.
Kharkov Universitet, Astronomicheskaia observatoriia, Trudy, v. 1 (9), pp. 9–10, 1951 (in Russian)
(*AJ*, 1951, #7404)

52. PHOTOGRAPHIC SPECTROPHOTOMETRY OF VENUS, MARS, JUPITER, AND SATURN
Barabashov, N. P., Chekirda, A. T.
Kharkov Universitet, Astronomischeskaia observatoriia, Trudy, v. 1 (9), pp. 19–23, 1951 (in Russian)
(*AJ*, 1951, #7116)

53. DETERMINATION OF THE DEGREE OF SMOOTHNESS OF THE PLANETARY SURFACES BY PHOTOMETRIC METHODS
Sytinskaya, N. N.
Leningrad Universitet, Uchenye Zapiski, no. 116; *Mathematikh nauk*, no. 18, pp. 123–137, 1949 (in Russian); *Astronomicheskaia observatoriia, Trudy*, v. 13, pp. 123–137, 1949
(*AJ*, 1949, #2424)

With a photometer, investigations were first made of the reflectivity of sunlight on terrestrial formations at various angles of incidence, and the smoothness coefficient q defined by $B = B_0 \times \cos \delta \phi$ was determined.

54. ÜBER DIE ALBEDO DER PLANETEN UND DIE PHOTOMETRISCHE BESTIMMUNG VON PLANETOIDENDURCHMESSERN (THE ALBEDO OF THE PLANETS AND THE PHOTOMETRIC DETERMINATION OF PLANETOIDAL DIAMETERS)
Stumpff, K.
Astronomische Nachrichten, v. 276, pp. 118–126, 1948
(*AJ*, 1948, #7020)

The spherical albedo $A = p \times q$, according to the definition of Bond and Russell, can be determined on the planet's surface without knowledge of the reflection law, if the full course of the phase-brightness curve of the planet is known. Various ways are shown in which to attain this goal by derivation of empirical relations between q and the phase coefficient. For the minor planets, with the exception of the first four, the determination of the albedo is not possible even with this method, because the diameters upon which p depends are unknown. In 1917, L. Bell found a correlation between p and γ, and based a method for estimating the planetoidal diameter on it. By adopting the phase coefficients of the four large moons of Jupiter, which had meanwhile become known through the work of Stebbins (1926-1927), the statistical basis for this correlation has been markedly improved. It is used for the derivation of 21 planetoidal diameters, including the four known ones which served as controls.

55. LE PHOTOMÈTRE À OEIL-DE-CHAT ET SES APPLICATIONS (THE CAT'S-EYE PHOTOMETER AND ITS APPLICATIONS)
Dubois, J. E.
Ciel et terre, v. 58, pp. 350–361, 1942
(*AJ*, 1942, #1502)

This paper includes description and applications of the cat's-eye photometer, reduction of measurements, cal-

ibration of the photometer, and applications to photometric observations of the ash-gray moonlight and of eclipses.

56. THE ALBEDOS AND THEIR SIGNIFICANCE IN THE DETERMINATION OF THE MASS OF THE PLANETS
Hacar, B.
Říše Hvězd, v. 23, pp. 115–121, 1942
(in Czechoslovakian)
(*AJ*, 1942, #5105)

57. ON THE SCATTERING OF LIGHT THROUGH THE PLANETARY ATMOSPHERES
Ambarzumian, V. A.
Russkii astronomicheskii zhurnal, v. 19, no. 5, pp. 30–41, 1942 (in Russian)
(*AJ*, 1943, #5102)

58. SCATTERING AND ABSORPTION OF LIGHT IN PLANETARY ATMOSPHERES. I
Ambarzumian, V. A.
Leningrad Universitet, Uchenye Zapiski, no. 82, pp. 64–85, 1941 (in Russian with English abstract); *Astronomicheskaia observatoriia, Trudy*, no. 12, 1941
(*AJ*, 1943, #5101)

59. THE PRINCIPLES OF PLANETARY COLOR RESEARCH
Haas, W. H.
Popular Astronomy, v. 48, pp. 69–76, 1940
(*AJ*, 1940, #5112)

60. LOWELL OBSERVATORY PLANETARY RADIOMETRIC INVESTIGATIONS
Lampland, C. O.
American Astronomical Society, Publications of the, v. 9, pp. 174–175, 1939
(*AJ*, 1939, #5115)

61. PROBLEMS IN THE ABSOLUTE PHOTOMETRY OF BODIES IN THE SOLAR SYSTEM
Sharonov, V. V.
Leningrad Universitet, Zapiski, seriia astronomicheskaia, no. 53, pp. 5–36, 1939
(in Russian)
(*AJ*, 1940, #5126)

62. L'ALBEDO DES PLANÈTES ET DE LEURS SATELLITES (THE ALBEDO OF THE PLANETS AND THEIR SATELLITES)
Rougier, G.
L'Astronomie, v. 51, pp. 165–184, 1937
(*AJ*, 1937, #5114)

This paper discusses Bond's definition of the albedo, the instrumentation for photoelectric photometry of the Sun, and the values of the albedos for the planets and the Moon.

63. TENTATIVI DI FOTOMETRIA FOTOELETTRICA DELLE SUPERFICIE PLANETARIE (TENTATIVE RESULTS OF PHOTOELECTRIC PHOTOMETRY OF THE PLANETARY SURFACES)
Maggini, M.
Atti della accademia nazionale dei Lincei, Rendiconti, Classe di scienza fisiche, matematiche e naturali, v. 24, no. 6, pp. 278–282, 1937
(*AJ*, 1937, #5112)

A photometric apparatus for the measurement of the brightness of planetary spots in two wavelengths is discussed, and the first results of measurements of Jupiter and Saturn, as well as of the Saturn rings, are introduced.

64. ON THE ILLUMINATION OF A PLANET COVERED WITH A THICK ATMOSPHERE (WITH SOME APPLICATIONS TO MAJOR PLANETS AND VENUS)
Gerasimovic, V. P.
Pulkovo, Astronomicheskaia observatoriia, Biulleten, v. 15, no. 4, p. 1, 1937
(*AJ*, 1937, #5104)

65. ÜBER DIE ATMOSPHÄREN DER PLANETEN (THE ATMOSPHERES OF THE PLANETS)
Kopal, Z.
Astronomische Nachrichten, v. 257, pp. 129–134, 1936
(*AJ*, 1935 #5123)

The edge darkening of the planetary discs is explained by the light extinction effect. On the basis of known intensity measurements, calculations are made of the height of the atmosphere and the extinction coefficients for Mars, Jupiter, and Saturn. Finally, the author applies his method to the Sun.

66. OBJECTIFS ASTRONOMIQUES ET COLORATIONS PLANÉTAIRES (ASTRONOMICAL OBJECTIVES AND PLANETARY COLORS)
Roy, L.
Bulletin de la société d'astronomie populaire de Toulouse, v. 26, pp. 104–114, 1935
(***AJ,*** 1935, #5131)

67. ON THE CHARACTERISTICS OF THE REFLECTIVITY OF CELESTIAL BODIES
Sharonov, V. V.
Russkii astronomicheskii zhurnal, v. 11, pp. 477–483, 1934 (in Russian with French résumé)
(***AJ,*** 1934, #5110)

This paper presents proof that the value upon which the light-diffusion theory is based is the "brightness coefficient"; i.e., the relationship of surface brightness in several directions to its illumination. Formulas are developed which express other photometric parameters by means of the brightness coefficient (e.g., the albedo according to Lambert and Bond).

68. EIN FARBENEFFEKT BEI STERN-BEDECKUNGEN (A COLOR EFFECT IN STELLAR OCCULTATIONS)
Schembor, F.
Astronomische Nachrichten, v. 249, pp. 65–68, 1933
(***AJ,*** 1933, #1707)

It is shown that a contrast error appears in such a way that the color effect for a particular phase becomes minute to the observer.

69. ÜBER HELLIGKEITSSCHWANKUNGEN DER PLANETEN MARS, JUPITER, SATURN, URANUS, NEPTUN AND DAMIT ZUSAMMENHÄNGENDE ERSCHEINUNGEN (VARIATIONS IN BRIGHTNESS OF THE PLANETS MARS, JUPITER, SATURN, URANUS, AND NEPTUNE AND RELATED PHENOMENA)
Becker, W.
Sitzungsberichte der preussischen Akademie der Wissenschaften, physikalisch-mathematische Klasse, no. 28, 1933
(***AJ,*** 1933, #5507)

70. VISUELLE MESSUNGEN DER PLANETEN-FARBEN (VISUAL MEASUREMENTS OF THE COLORS OF THE PLANETS)
Graff, K.
Mitteilungen der wiener Sternwarte, v. 1, pp. 25–26, 1931
(***AJ,*** 1931, #5804)

71. RECHERCHES SUR LA POLARISATION DE LA LUMIÈRE DES PLANÈTES ET DE QUELQUES SUBSTANCES TERRESTRES (RESEARCH ON THE POLARIZATION OF THE LIGHT OF THE PLANETS AND OF SOME TERRESTRIAL SUBSTANCES)
Lyot, B.
Annales de l'observatoire de Paris, Meudon Section, v. 8, fasc. 1, 1930
(See also ***Annales de l'observatoire de Meudon,*** v. 8, 1929, 169 pp.)
(***AJ,*** 1930, #5204)

72. FARBENÄNDERUNG DER ÄQUATOR-STREIFEN HAT EINE PERIODE VON 12.08 JAHREN (THE COLOR CHANGE IN THE EQUATORIAL BAND HAS A CYCLE OF 12.08 YEARS)
Williams, A. S.
Observatory, v. 52, pp. 87–88, 1929
(***AJ,*** 1929, #5706)

73. FARBENÄNDERUNG DER STREIFEN 1928 BIS 1929 (COLOR CHANGES IN THE BANDS, 1928 TO 1929)
Phillips, T. E. R.
Observatory, v. 52, pp. 151-153, 1929
(***AJ,*** 1929, #5706)

74. EXPERIMENTELLES ZUR PHOTOMETRIE DES ROTATIONSELLIPSOIDS (EXPERIMENTS WITH PHOTOMETRY OF ROTATING ELLIPSOIDS)
Wirtz, C.
Sitzungsberichte der preussischen Akademie der Wissenschaften, physikalisch-mathematische Klasse, no. 27, 1929
(***AJ,*** 1929, #5101)

Photometric measurements were made on four artificial planets with oblatenesses 0 (sphere) to 1/3. Each of the four planets was made of either diffuse silver or

chalk. The planets were mounted on an optical bench and observations were made of the total brightness at 0-deg phase angles (full illumination), with variation of the planetocentric latitude of the Earth. The constancy of the light sources, the mean measurement errors, and the systematic errors of various origins are discussed. Comparison is made with theory, taking as a basis Lambert's and Lommel's laws. The influence of errors in the dimensions of the artificial planets is mentioned. Some of the results are: the general tendency of silver planets to come closest to Lambert's law, and chalk planets to Lommel's law, and possible explanations for this; plans for further experimental investigations; comments on the oblateness of Uranus.

75. RECENT RADIOMETRIC OBSERVATIONS OF THE PLANETS
Lampland, C. O.
Popular Astronomy, v. 36, p. 238, 1928
(*AJ*, 1928, #5208)

76. ON PHOTOGRAPHS OF THE BRIGHTER PLANETS BY LIGHT OF DIFFERENT COLOURS
Wright, W. H.
Royal Astronomical Society, Monthly Notices of the, v. 88, pp. 709–718, 1928
(*AJ*, 1928, #5804)

77. ÜBER DIE HELLIGKEIT DER ERDE UND DER PLANETEN IN VERSCHIEDENEN ENTFERNUNGEN (THE BRIGHTNESS OF THE EARTH AND THE PLANETS AT DIFFERENT DISTANCES)
Tass, A.
Stella, v. 1, pp. 87–89, 1928 (in Hungarian)
(*AJ*, 1928, #5107a)

78. ÜBER DIE LICHTSTÄRKE, IN WELCHER DIE PLANETEN EINANDER ERSCHEINEN (THE LIGHT INTENSITY OF PLANETS WITH RESPECT TO ONE ANOTHER)
Schoch, C.
Die Sterne, pp. 172–175, 1926
(*AJ*, 1926, #5102)

The brightness of the Sun, planets, and satellites as seen by observers on Venus, the Earth, Mars, and Jupiter is discussed from a theoretical viewpoint.

79. OBSERVATION WITH A WEDGE PHOTOMETER
Sharonov, V. V.
Mirovedenie, no. 1–2, 1925 (in Russian)

80. ÜBER DIE TEMPERATUR DER PLANETEN (THE TEMPERATURE OF THE PLANETS)
Schoenberg, E.
Physikalische Zeitschrift, v. 26, p. 870, 1925
(*AJ*, 1925, #5104)

A systematic study of radiation problems is presented in three major sections. The first treats problems prior to the American radiation measurements. The second section is concerned with the status of the problem following the publication of the latest American radiation measurements of planets. In the final chapter, the possibility of determining the atmospheric temperature and density of planets by means of photometric measurements of the crepuscular zone is considered.

81. THE INFLUENCE OF THE DIFFRACTION OF LIGHT ON THE DISTRIBUTION OF BRIGHTNESS OVER THE PLANETARY DISCUS
Fesenkov, V. G.
Russkii astronomicheskii zhurnal, v. 2, no. 2, pp. 17–30, 1925 (in English with Russian abstract)
(*AJ*, 1925, #5106)

82. ÉTUDE DES SURFACES PLANÉTAIRES PAR LA POLARISATION (STUDY OF PLANETARY SURFACES BY POLARIZATION)
Lyot, B.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 177, pp. 1015–1017, 1923
(*AJ*, 1925, #5105)

JUPITER

Books

83. UNTERSUCHUNG ÜBER DIE JUPITERATMOSPHÄRE (INVESTIGATION OF THE ATMOSPHERE OF JUPITER)
Schoenberg, E.
Festschrift für Elis Strömgren, Kopenhagen, 1940
(*AJ*, 1940, #3551)

A comprehensive work on photometric investigations of Jupiter, based on a total of eight different wavelengths, leads to the conclusion that the atmospheric mass located above the dark equatorial band is less dense than that above the light equatorial band. Furthermore, the large value of the dispersion coefficient at short wavelengths can be explained only by the existence of numerous small solid particles. Rotation-velocity measurements made for control purposes show that, in accordance with the already demonstrated difference in levels, the light spots rotate somewhat more rapidly (about 0.9%) than the dark bands. Finally, based on the work of H. E. Lau, the large dust content of the Jovian atmosphere is traced back to the constant volcanic activity on the surface of Jupiter.

Periodicals

84. THE COLORS OF JUPITER
Papazian, H. A.
Astronomical Society of the Pacific, Publications of the, v. 71, pp. 237–239, June 1959

To account for the colored band features seen on the planet, it is proposed that these are caused by charged-particle bombardment of normally colorless atmospheric condensates. (*PA*, 1960, #3411)

85. ULTRAVIOLET REFLECTIVITIES OF MARS AND JUPITER
Bogess, A., III, Dunkelman, L.
Astrophysical Journal, v. 129, no. 1, p. 236, January 1959 (Letter)

86. ABSOLUTE PHOTOMETRY OF JUPITER AND SATURN WITH LIGHT FILTERS
Lebedinets, V. N.
Kharkov Universitet, Astronomicheskaia observatoriia, Trudy, v. 12, pp. 167–239, 1957 (in Russian); *Uchenye Zapiski,* v. 91, pp. 167–239, 1957
(*AJ*, 1957, #7607)

This extensive monograph includes: Report on Work on the Surface Photometry of Jupiter and Saturn; The Brightness Distribution on the Discs of Jupiter and Saturn; Absolute Photometry of Jupiter and Saturn; Conclusion.

87. L'OPPOSITION DE JUPITER EN 1956 (THE OPPOSITION OF JUPITER IN 1956)
Dollfus, A.
L'Astronomie, v. 70, pp. 483–486, 1956
(*AJ*, 1956, #7604)

88. THE COLOURS OF JUPITER
British Interplanetary Society, Journal of the, v. 15, pp. 342–343, 1956
(*AJ*, 1956, #7624)

89. COLORS ON JUPITER
Rice, F. O.
Journal of Chemical Physics, v. 24, p. 1259, 1956
(*AJ*, 1956, #7614)

90. PHOTOMETRY OF THE MOONS OF JUPITER
Moisseyenko, E. A.
Leningrad Universitet, Nauchnyi Biulleten, no. 33, pp. 7–8, 1955 (in Russian)
(*AJ*, 1955, #7635)

91. INTEGRAL COLORIMETRY OF JUPITER IN 1954
Sharonov, V. V.
Astronomicheskii Tsirkuliar, no. 152, pp. 14-15, 1954 (in Russian)
(*AJ*, 1954, #7602)

92. PHOTOMETRIC OBSERVATION OF THE OCCULTATION OF σ ARIETIS BY JUPITER
Baum, W. A., Code, A. D.
Astronomical Journal, v. 58, pp. 108–112, May 1953

The occultation of σ Arietis by the atmosphere of Jupiter on November 20, 1952, was observed photoelectrically. Differential refraction in the upper stratospheric layers is shown to be the principal effect, and depends solely upon

the geometry of the occultation and the scale height. The scale height in turn is a function of the ratio of the mean molecular weight of the atmosphere to its temperature. The best correspondence to the observation is obtained for a mean molecular weight $\bar{\mu} = 3.3$, which is in substantial agreement with previous indirect estimates. The uncertainty, however, is such that it is not possible to distinguish between these estimates.

93. COLORIMETRIC OBSERVATIONS OF VENUS AND JUPITER
Sharonov, V. V.
Astronomicheskii Tsirkuliar, no. 138, p. 7, 1953 (in Russian)
(***AJ,*** 1953, #7117)

94. PRELIMINARY REPORT ON THE PHOTOELECTRIC OBSERVATIONS OF ECLIPSES OF JUPITER'S SATELLITES
Takenouchi, T.
Tokyo Astronomical Observatory, Annals of the, University of Tokyo, (2), v. 3, pp. 196–210, 1953
(***AJ,*** 1953, #7630)

The course of the brightness in the eclipse of Jupiter's moons and its theoretical interpretation allow conclusions to be drawn concerning the physical conditions of Jupiter and its satellites. The most probable light curve is calculated, taking into consideration all contributing factors. The curve is compared with the observed light curve of the third moon, Ganymede, and the brightness of the fourth satellite is selected as the intensity standard.

95. STRÖMUNGS- UND ROTATIONSVERHÄLTNISSE AUF JUPITER 1950 (CURRENT AND ROTATION RATIOS ON JUPITER, 1950)
Mädlow, E.
Astronomische Nachrichten, v. 280, pp. 161–164, 1952
(***AJ,*** 1952, #7606)

96. PHOTOMETRY OF JUPITER
Lebedinets, V. N.
Kharkov Universitet, Astronomicheskaia observatoriia, Trudy, v. 2(10), pp. 33–43, 1952 (in Russian); ***Uchenye Zapiski,*** v. 42, pp. 33–43, 1952
(***AJ,*** 1952, #7605)

The existing photometry of Jupiter is studied and the observed brightness distribution is compared with Sobolev's theoretical distribution.

97. VISUELLE INTENSITÄTSSCHÄTZUNGEN AUF JUPITER (VISUAL INTENSITY ESTIMATES OF JUPITER)
Roth, G. D.
Die Sterne, v. 28, p. 123, 1952
(***AJ,*** 1952)

98. THE DEPENDENCE OF THE INTENSITY OF JUPITER'S BANDS ON SUNSPOT ACTIVITY
Bakharev, A. M.
Vsesoiuznoe astronomo-geodezicheskoe obshchestvo, Biulleten, no. 4 (11), pp. 14–16, 1950 (in Russian)
(***AJ,*** 1948, #7603)

99. PHOTOMETRIE DER HELLEN UND DUNKLEN ZONEN JUPITERS (PHOTOMETRY OF THE LIGHT AND DARK REGIONS OF JUPITER)
Barabashov, N. P.
Kharkov Universitet, Astronomischeskaia observatoriia, Publikatsii, v. 8, pp. 51–64, 1948 (in Russian)
(***AJ,*** 1948, #7604)

100. DIE ATMOSPHÄREN DER VIER HELLEN JUPITERMONDE (THE ATMOSPHERES OF THE FOUR BRIGHT MOONS OF JUPITER)
Guthnick, P.
Forschungen und Fortschritte, v. 21/23, pp. 14–16, 1947
(***AJ,*** 1947, #5703)

Several indications are shown of the existence of atmospheres on the four bright moons of Jupiter. Photoelectric photometric observations during the Jupiter oppositions of 1942–1943 and 1944–1945 give credence to the existence of atmospheres for moons I to IV. The existence of an atmosphere on moon III is demonstrated by means of photographs of its spectrum.

101. PHYSICAL MEANING OF THE COLOR MANIFESTATIONS ON THE DISC OF JUPITER
Sharonov, V. V.
Akademiia nauk SSSR, Doklady, v. 39, pp. 183–184, 1943 (in Russian)
(***AJ,*** 1943, Part 2, #5704)

102. ZUR DYNAMIK DER JUPITERATMOSPHÄRE (THE DYNAMICS OF JUPITER'S ATMOSPHERE)

Schoenberg, E.
Astronomische Nachrichten, v. 273, pp. 113–123, 1942
(*AJ*, 1942, #5705)

Starting with the assumption of a rigid planetary surface in the equatorial region (up to ± 40 deg latitude) which is supported by the constancy of the five main bands of the visible surface, the stability of the currents in the atmosphere of Jupiter is investigated on the basis of the Helmholtz theory of air rings. On the basis of earlier photometric results, the assumpton is made that the dark bands on the surface of the planet lie at a higher atmospheric level than the bright equatorial band. The consistent width of these bands is explained by volcanic chains or fissures in the solid surface of the planet, and the bands themselves are conceived of as clouds of expulsion or condensation products above the fissures.

103. DIE CHEMISCHE NATUR DER FÄRBUNG DER JUPITERWOLKEN (THE CHEMICAL NATURE OF THE COLORING OF JUPITER'S CLOUDS)

Heilmann, J.
Weltall, v. 41, pp. 65–66, 1941
(*AJ*, 1941, #5708)

The investigation made by R. Wildt is discussed.

104. DETERMINATION OF ABSOLUTE PHOTOGRAPHIC BRIGHTNESS-FACTORS OF THE APPARENT SURFACE OF JUPITER

Radlova, L. N.
Leningrad Universitet, Zapiski, seriia astronomicheskaia, no. 31, pp. 106–115, 1940
(in Russian with English abstract)
(*AJ*, 1940, #5710)

Photometric studies are made of Jupiter's disc by means of comparison with extrafocal stellar photographs. The relative brightness distribution on the disc, the value of the absolute surface brightness, and the brightness factor are determined.

105. ABSOLUTE PHOTOGRAPHIC PHOTOMETRY AND COLORIMETRY OF JUPITER'S DISC AT THE OPPOSITION OF 1938

Sharonov, V. V.
Pulkovo, Astronomicheskaia observatoriia, Tsirkuliar, no. 30, pp. 48–64, 1940
(in English wth Russian abstract)
(*AJ*, 1940, #5711)

For the purpose of photometric evaluation, a large number of photographic as well as photovisual pictures of Jupiter were obtained at the Tashkend Observatory in the fall of 1938. Density markings were superimposed on each photograph with a tube photometer, and, in order to determine absolute brightness values, extrafocal exposures were made of stars, and in particular of Capella, at the same zenith distance. The pictures of Jupiter were evaluated with the aid of a recording photometer, and an equatorial cross section and a meridional cross section were recorded. The reduction method used to determine the absolute brightnesses in these two views of Jupiter's surface is explained in detail and explicitly discussed. As end results, the course of the brightness in the photographic as well as the photovisual region and the course of the color are given in tabular and graphic form for both views.

106. ASSORBIMENTO E DIFFUSIONE NELLE ATMOSFERE PLANETARIE. I. LA DISTRIBUZIONE DELL' INTENSITÀ LUMINOSA LUNGO LA ZONA EQUATORIALE DI GIOVE (ABSORPTION AND DIFFUSION IN PLANETARY ATMOSPHERES. I. THE DISTRIBUTION OF LIGHT INTENSITY ALONG THE EQUATORIAL ZONE OF JUPITER)

Maggini, M.
Memorie della società astronomica italiana, nuova serie, v. 12, pp. 63–91, 1939
(*AJ*, 1939, #5713)

Twenty-nine plates taken of the equatorial zone of Jupiter at wavelengths 580 $\mu\mu$ and 425 $\mu\mu$ in the winter of 1928–1929 were measured photometrically. The intensity decreases more rapidly from the center to the edge for 425 $\mu\mu$, but at the edge, the two types of light have approximately the same value of 0.1. At the wavelength 425 $\mu\mu$, there is a sharp deviation from the cosine law near the edge, which is also visible in the plates taken without filters at the Juvisy Observatory. The determination of the color index and the spectral type of the Jupiter disc

follow. Finally, the equations derived by Gerasimovič from the convection equation are employed; from these, it is concluded that the model of the atmosphere most closely agreeing with these observations is that in which two regions, separated by a discontinuity surface, are assumed, the upper one containing the molecular gases and the lower the condensation products.

107. ASSORBIMENTO E DIFFUSIONE NELLE ATMOSFERE PLANETARIE. II. DIFFUSIONE MOLECOLARE E ALTEZZA DELL' ATMOSFERA DI GIOVE (ABSORPTION AND DIFFUSION IN PLANETARY ATMOSPHERES. II. MOLECULAR DIFFUSION AND ALTITUDE OF THE ATMOSPHERE OF JUPITER)
Maggini, M.
Memorie della società astronomica italiana, nuova serie, v. 12, pp. 237–251, 1939
(***AJ,*** 1939, #5714)

The intensity-distribution curves for wavelengths 580 $\mu\mu$ and 425 $\mu\mu$ of Jupiter are compared with those obtained through molecular diffusion. The transport power of the Jovian atmosphere is ascertained. The atmosphere of Jupiter is shown to be very dense. What is seen as a disc is actually the surface of the atmosphere. The diffusion coefficients are derived from the theoretical densities of the envelope, and the diffusion at the edge of the disc is studied. The height of the atmosphere is found to be 3550 km.

108. COLOURS ON JUPITER
Haas, W. H.
Royal Astronomical Society of Canada, Journal of the, v. 33, pp. 283–286, 1939
(***AJ,*** 1939)

109. DETERMINATION OF JUPITER'S AND SATURN'S COLORS BY PHOTOMETRICAL AND COLORIMETRICAL OBSERVATIONS
Radlova, L. N.
Russkii astronomicheskii zhurnal, v. 16, no. 5, pp. 41–50, 1939 (in Russian with English abstract)
(***AJ,*** 1939, #5722)

At the Tashkend Observatory, the colors of Saturn and Jupiter were measured by means of the color-filter method and with a colorimeter with a blue wedge, and extrafocal pictures of the planets and stars were compared. The colorimeter method was found to be more accurate than the color-filter method. The color equivalents of the planets are: Jupiter 0.99 (Spectrum *F*9), Saturn 1.18 (Spectrum *G*3).

110. PHOTOGRAPHISCHE PHOTOMETRIE DER JUPITERSCHEIBE (PHOTOGRAPHIC PHOTOMETRY OF JUPITER'S DISC)
Plaetschke, J.
Zeitschrift für Astrophysik, v. 19, pp. 69–115, 1939
(***AJ,*** 1939, #5720)

From photographic exposures of Jupiter through various color filters made at the Breslau 11-m reflector, the brightness distribution along the bright equatorial bands and along a dark band was determined for five wavelength regions. This was compared with the values ascertained by Barabashov in three other spectral regions. Physical conclusions concerning Jupiter's atmosphere and surface are drawn from the brightness distribution.

111. THE COLOUR VARIATIONS OF JUPITER'S EQUATORIAL ZONE
St. Williams, A.
British Astronomical Association, Journal of the, v. 47, pp. 68–70, 1937
(***AJ,*** 1936, #5411)

112. ON THE PERIODIC VARIATION IN THE COLOURS OF THE TWO EQUATORIAL BELTS OF JUPITER
St. Williams, A.
Royal Astronomical Society, Monthly Notices of the, v. 97, pp. 105–108, 1937
(***AJ,*** 1936, #5710)

113. COLOUR VARIATION IN JUPITER'S EQUATORIAL ZONE
McIntosh, R. A.
British Astronomical Association, Journal of the, v. 46, pp. 285–289, 1936
(***AJ,*** 1936, #5705)

The variability of the color of the equatorial zone of Jupiter with a periodicity of 7.35 years is discussed.

114. REMARQUES SUR LA POLARISATION DE LA SURFACE DE JUPITER (REMARKS ON THE POLARIZATION OF THE SURFACE OF JUPITER)
Salet, P.
Journal des observateurs, v. 19, pp. 17–18, 1936
(*AJ*, 1936, #5707)

115. THE BRIGHTNESS RATIO OF THE CENTRAL REGIONS OF THE MARS AND JUPITER DISCS
Barabashov, N. P., Semeykin, B. E.
Russkii astronomicheskii zhurnal, v. 12,
pp. 337–338, 1935 (in Russian)
(*AJ*, 1935, #5503)

Pictures of Jupiter and Mars have been taken with blue, yellow, and red filters. The central region of the Jupiter disc reflects 11 times more light in blue light than the corresponding region of Mars. This ratio becomes twice as small with the yellow filter, and almost three times as small with the red.

116. INVESTIGATION OF THE DISTRIBUTION OF BRIGHTNESS ON THE DISC OF JUPITER BY MEANS OF COLOR FILTERS
Barabashov, N. P., Semeykin, B. E.
Russkii astronomicheskii zhurnal, v. 11,
pp. 126–131, 1934 (in Russian with English abstract)
(*AJ*, 1934, #5702)

Results are given of brightness-distribution measurements of the Jupiter disc, using photographic plates which were taken through red, yellow, and blue filters. The intensity curves of the brightness distribution along the equator are generally subject to Lambert's law. The intensity distribution in the dark zone is the same as at the equator. The color of the dark zones is reddish. The effect of the atmosphere on the brightness distribution is evidently small. Details on Jupiter are more easily visible in blue radiation than in red.

117. ON THE ATMOSPHERES OF JUPITER AND SATURN
Barabashov, N. P., Semeykin, B. E.
Russkii astronomicheskii zhurnal, v. 11,
pp. 301–304, 1934 (in Russian with English abstract)
(*AJ*, 1934, #5703)

The results of the photometric studies made by the authors are as follows: (1) The absorption in the atmospheres of Jupiter and Saturn is large. (2) Since the indicatrix of diffusion is unsymmetrical, Rayleigh's law is hardly applicable to the atmospheres of these planets. (3) It is very probable that these atmospheres constitute diffuse media in which particles swim whose circumference is greater than λ.

118. PHOTOGRAPHISCHE PHOTOMETRIE DES PLANETEN JUPITER UND UNTERSUCHUNGEN DER JUPITER- UND SATURN-ATMOSPHÄREN (PHOTOGRAPHIC PHOTOMETRY OF JUPITER AND INVESTIGATIONS OF THE ATMOSPHERES OF JUPITER AND SATURN)
Barabashov, N. P. Semeykin, B. E.
Zeitschrift für Astrophysik, v. 8, p. 189, 1934
(*AJ*, 1934, #5704)

The results of photometric measurements of photographs of Jupiter are discussed. The most important conclusions are as follows: (1) The atmosphere of Jupiter is quite different from that of Mars and the Earth. (2) It must have strong absorption and little scattering. (3) Rayleigh's scattering law is not valid for Jupiter's atmosphere. (4) The atmosphere is probably full of solid particles.

119. MESURES PHOTOMÉTRIQUES DE JUPITER, MARS ET REGULUS FAITES À L'OCCASION DE LA CONJONCTION DU 4 JUIN 1933 (PHOTOMETRIC MEASUREMENTS OF JUPITER, MARS, AND REGULUS MADE DURING THE CONJUNCTION OF JUNE 4, 1933)
Blum, G.
L'Astronomie, v. 47, pp. 334–335, 1933
(*AJ*, 1933, #5717)

120. RESULTÄTE EINER BEARBEITUNG DER PHOTOGRAMME DES JUPITER. TEIL II (RESULTS OF A TREATMENT OF JUPITER PHOTOGRAMS. PART II)
Barabashov, N. P.
Kharkov Universitet, Astronomicheskaia observatoriia, Publikatsii, v. 4, pp. 3–44, 1933
(*AJ*, 1933, #5714)

The author analyzes the brightness-distribution curves obtained by him for a planetary disc, discusses the radiation theories and their comparison with observation, as

well as a theory of the intensity distribution on the disc, and treats the effects of the scattered light in the planet's atmosphere.

121. FOTOGRAFIČNA FOTOMETRIJA JUPITERVOGO DISKA (PHOTOGRAPHIC PHOTOMETRY OF JUPITER'S DISC)
Barabashov, N. P.
Kharkov Universitet, Astronomicheskaia observatoriia, Publikatsii, v. 3, pp. 3–52, 1931
(in Ukrainian and German)
(*AJ*, 1931, #5703)

Nine photographs of Jupiter from exposures made at Simeis were measured with a Hartmann microphotometer. The results are presented in tables and figures, and the intensity curves for individual zones and for the central meridian are graphically represented. It is shown that the intensity differences turn out to be noticeably smaller photographically than visually.

122. LICHTELEKTRISCHE BEOBACHTUNGEN DER PLANETEN URANUS UND JUPITER (PHOTOELECTRIC OBSERVATIONS OF THE PLANETS URANUS AND JUPITER)
Güssow, M.
Astronomische Nachrichten, v. 237, pp. 229–230, 1929
(*AJ*, 1929, #5905)

123. RICERCHE POLARIGRAFICHE SUI PIANETI. I. LA POLARIZZAZIONE SUL DISCO DI GIOVE (POLARIGRAPHIC RESEARCH OF THE PLANETS. I. THE POLARIZATION OF THE DISC OF JUPITER)
Maggini, M.
Memorie della società astronomica italiana, v. 4, pp. 357–377, 1929
(*AJ*, 1929, #5708)

Exposures were made with a Nikol prism, parallel and perpendicular to a specific diameter at a wavelength of 560 $\mu\mu$. The difference in densities yields the amount of polarized light. The polarization changes most in the radial direction; it is strongest at the poles (25%) and only 14% at the equator. Especially great differences result between bright and dark spots and in the shadows of the satellites; this may be attributed to differences in the depth of the atmosphere.

124. ÜBER DIE EXTINKTION DES LICHTES IN DER JUPITERATMOSPHÄRE (CONCERNING THE EXTINCTION OF LIGHT IN THE ATMOSPHERE OF JUPITER)
Yeropkin, D. J.
Zeitschrift für Astrophysik, v. 3, pp. 163–170, 1929
(*AJ*, 1929, #5702)

An investigation is made using photographs of the eclipse curves of the Jupiter satellites. The curves verify the characteristic influence of the Jupiter atmosphere on the brightness decrease of the satellites. The extinction in the atmosphere of Jupiter amounts to 9% of the total incident flux on the disc of Jupiter.

125. FURTHER PHOTOMETRIC MEASURES OF JUPITER'S SATELLITES AND URANUS, WITH TESTS OF THE SOLAR CONSTANT
Stebbins, J., Jacobsen, T. S.
Lick Observatory Bulletin, v. 13, no. 401, pp. 180–195, 1928
(*AJ*, 1928, #4509)

The photometric measurements of the moons of Jupiter in 1927 confirm the results of the previous year. The brightness of Uranus proved to be constant. For 47 nights, the variations in the solar constant were too small to be observed.

126. DIE FARBENINDIZES DER JUPITER-SATELLITEN (THE COLOR INDEXES OF JUPITER'S SATELLITES)
Guthnick, P.
Sitzungsberichte der preussischen Akademie der Wissenschaften, physikalisch-mathematische Klasse, pp. 256–257, 1928
(*AJ*, 1928, #5713)

The author defends his method of color-index determination against Stebbins' objections. He demonstrates the agreement of his relative color indexes for satellites I to III with those of Stebbins and shows that for satellite IV, a deviation substantiated in the postulates of his method must occur.

127. THE PLANET JUPITER AS PHOTOGRAPHED BY ULTRA-VIOLET LIGHT AND BY LIGHT OF THE EXTREME RED
Wright, W. H.
Astronomical Society of the Pacific, Publications of the, v. 39, pp. 358–359, 1927
(*AJ*, 1928, #5708)

128. DER LICHTWECHSEL DER JUPITERMONDE (CHANGES IN THE LIGHT OF JUPITER'S MOONS)
Sticker, B.
Die Himmelswelt, v. 37, pp. 200–204, 340–343, 1927
(*AJ*, 1927, #5721)

This paper reviews the work of Stebbins and Guthnick.

129. VERGLEICHUNG LICHTELEKTRISCHER, PHOTOGRAPHISCHER UND VISUELLER PHOTOMETRISCHER BEOBACHTUNGEN DER VIER HELLEN JUPITERSATELLITEN (COMPARISON OF PHOTOELECTRIC, PHOTOGRAPHIC, AND VISUAL PHOTOMETRIC OBSERVATIONS OF THE FOUR BRIGHT SATELLITES OF JUPITER)
Guthnick, P.
Sitzungsberichte der preussischen Akademie der Wissenschaften, pp. 112–134, 1927
(*AJ*, 1927, #5720)

The general course of the light curves of 1926 is the same as that derived from visual observations made between 1858 and 1906. The visual observations indicate larger amplitudes than do the photoelectric and photographic ones; the secondary waves observed visually disappear in the photoelectric observations. The differences among spectral regions are used by way of explanation.

130. NOTE ON THREE RECENT MUTUAL ECLIPSES OF JUPITER'S SATELLITES
Peek, B. M.
British Astronomical Association, Journal of the, v. 36, pp. 287–289, 1926
(*AJ*, 1926)

Observations on the brightness variations are discussed.

131. SURFACE PHOTOMETRY OF JUPITER WITH THE HARVARD 60-INCH REFLECTOR
Shapley, H.
Harvard College Observatory Bulletin, no. 834, 1926
(*AJ*, 1926, #5703)

The distribution of violet, blue, green, yellow, and red is derived from five photographs, using various plates and filters.

132. CHANGES IN THE BRIGHTNESS AND THE COLOR OF THE FIRST SATELLITE OF JUPITER
Sanyutin, N. P.
Mirovedenie, no. 3, p. 247, 1926
(*AJ*, 1927, #5725)

On the basis of his own and J. D. Bruns' observations, made in Odessa with the 6-in. Bardou refractor, the author reports that the brightness of the first satellite is greatest at the second and third contacts, and smallest at the center of the planetary disc. The color changes from blue at the second and third contacts to yellow at the center of the disc. This phenomenon is explained by the difference in illumination of the satellite by the Sun and by Jupiter, and by the presence of a high and dense atmosphere.

MARS

Books

133. MARS
Barabashov, N. P.
Kharkov Regional Publisher, Kharkov, 1956
(in Russian)
(*AJ*, 1958, #7405)

134. IL PIANETA MARTE (THE PLANET MARS)
Maggini, M.
U. Hoepli, Milan, Italy, 1939
(*AJ*, 1939, #5515)

The book gives a comprehensive picture of our knowledge about Mars for professional and avocational astronomers. The following are discussed: old and recent investigations; results of visual, photographic, spectrographic, and polarimetric observations; problems concerning topography, meteorology, and organic life on the planet Mars.

135. THE "GREEN" AREAS OF MARS AND COLOR VISION
Schmidt, I.
In "Proceedings of the 10th International Astronautical Congress, London, August 30–September 5, 1959," pp. 171–180
Springer-Verlag, Vienna, 1960

The appearance of the "green" areas of Mars has been discussed from the standpoint of visual physiology. The conditions for perception of colors on Mars are favorable insofar as the observation is foveal and the luminance range is within that of daytime. Because of the smallness of some details, normal color vision may reach an area-intensity limit beyond which it becomes very unreliable. In order to elucidate whether the variable blueness, blue-greenness or greenness of the dark areas are real or not, the following factors have been discussed: (1) the transmittance of the atmospheres of Mars and Earth in its effect on the appearance of coloration on Mars; (2) the possibility of interpreting the coloration of the dark areas as a contrast phenomenon. Here we must consider the Sun as a chromatic illuminant, and the yellow-red bright areas as potential contrast-inducing areas. The production of contrasts was studied experimentally by using colored papers simulating the bright and dark areas. The experiments permit us to deduce that a contrast induction is possible on the surface of Mars, the contrast depending on hue, brightness, and saturation of contrast-inducing and contrasting area. Blurredness of contours enhances contrasts. An attempt has been made to explain the difference in the induced hue on small and large contrasting neutral gray areas. A method is shown for reducing contrast development which may be helpful in deciding about the real nature of the "green" areas of Mars.

136. THE PHYSICAL CONDITION OF THE PLANET MARS
Wanders, A. J. M.
In "Proceedings of the 9th International Astronautical Congress, Amsterdam, 1958"
Springer-Verlag, Vienna, 1959

A survey is made of our present knowledge of Mars as revealed by visual and astrophysical observations.

Reports

137. POLARIZATION OF LIGHT FROM THE MOON, MARS, VENUS, AND NGC 7023
Gehrels, T.
Paper presented at the 103rd AAS Meeting, Toronto, Canada, August 30–September 2, 1959
American Astronomical Society, Inc., New York, N.Y.
(Abstracted in *Astronomical Journal*, v. 64, p. 332, October 1959)

138. PHOTOELECTRIC ISOPHOTES OF MARS
Hosfeld, R.
Paper presented at the 92nd AAS Meeting, Princeton, N. J., April 3–6, 1955
American Astronomical Society, Inc., New York, N.Y.
(Abstracted in *Astronomical Journal*, v. 60, p. 164, June 1955)

Thirty photoelectric drift curves were obtained across the disc of Mars on the night of June 28–29, 1954, with the 12½-in. refractor at the McMillin Observatory, using a focal plane aperture 40 μ in diameter, or 1″.8. A contour map revealed some of the larger Martian features, but colors could not be measured because of the steep color curve of the visually corrected refractor.

139. HETEROCHROMATIC PHOTOGRAPHY AND PHOTOMETRY OF MARS IN 1937 AND 1939
Martz, E. P., Jr.
Paper presented at the 89th AAS Meeting, Boulder, Colo., August 26–30, 1953
American Astronomical Society, Inc., New York, N.Y.
(Abstracted in *Astronomical Journal*, v. 58, p. 221, 1953)

An extensive series of photographs of Mars consisting of approximately 3600 images was secured during the close approaches of 1937 and 1939. Coincident photographs were taken in the red, yellow, green, and blue-violet at corresponding effective wavelengths 6500 Å, 5600 Å, 5300 Å, and 4400 Å. A number of images were secured without color filter, and 300 images were secured on full-color Kodachrome film. Relative intensity curves have been derived for the different effective wavelengths and positions on the disc of the planet for a study of the scattering characteristics of the planetary atmosphere and the colors of the surface markings.

140. PHOTOGRAPHIC PHOTOMETRY OF MARS WITH COLOR FILTERS
Koval, I. K.
1957
Kharkov, University of, USSR
Thesis (in Russian)

141. THE ATMOSPHERE AND HAZE OF MARS
Öpik, E. J.
1960
Maryland, University of, College Park
Report

142. SOME RESULTS OF OBSERVATIONS OF MARS DURING THE GREAT OPPOSITION OF 1956
Sharonov, V. V.
August 14, 1959
U.S. Joint Publications Research Service, New York, N. Y.
U.S. JPRS 873-D, OTS: 59-11,766
(See also *Leningrad Universitet, Vestnik*, 1959)

The observations described here were conducted from August 11–September 24, 1956, at the Tashkend Astronomical Observatory. The basic task of the observation team was to conduct visual and photographic photometry of Mars, the results of which will be published in further reports by members of the observation team. The present article describes facts and conclusions based primarily on data derived from visual observations of the disc of Mars, which accompanied the photometric work for purposes of orientation and which were conducted on the guide of a normal astrograph and enlarged 100 to 600 times with the aid of the 6-in. refractor. (*AI/A*, 1960, #2040)

143. NATURAL ENVIRONMENT OF THE PLANET MARS
Shaw, J. H.
February 1959
Wright Air Development Division, Wright-Patterson AFB, Ohio
WADD Phase Technical Note 847-1
AD-242, 175

A summary of the present knowledge and speculations concerning the planet Mars is presented. The report is divided into a number of sections, each of which evaluates current information, theories, and speculations on one aspect of the environment. Extensive references are given at the end of each section.

Periodicals

144. POLARIZATION OF THE LIGHT FROM SUNSPOTS. RADIOMETRIC OBSERVATIONS OF MARS
Winton, W. M., Strong, J.
***Astrophysical Journal*, v. 131, pp. 459–469, March 1960**

Radiometric temperature measurements of Mars were made with the 200-in. reflector in 1954. This broad-band radiometry was augmented with spectra obtained with moderately good resolution with a grating spectrometer. (*PA*, 1960, #6872)

145. ULTRAVIOLET REFLECTIVITIES OF MARS AND JUPITER
Bogess, A., III, Dunkelman, L.
***Astrophysical Journal*, v. 129, no. 1, p. 236, January 1959 (Letter)**

146. REMARKS ON MARS AND VENUS
de Vaucouleurs, G.
Journal of Geophysical Research, v. 64, no. 11, pp. 1739–1744, November 1959

The significant astronomical and astrophysical facts, together with the rather fragmentary geophysical data for the two planets, are reviewed. These include tabulated information on: (1) orbital elements; (2) physical elements; (3) atmospheric composition; (4) planetary temperatures (black-body, gray-body, and radiometric) and densities. Recent research on Venusian clouds, and the new infrared absorption bands in the Martian atmosphere are discussed. (*PA*, 1960, #10,493)

147. MULTICOLOR PHOTOMETRY OF MARS IN 1958
de Vaucouleurs, G.
Planetary and Space Science, v. 2, no. 1, pp. 26–32, October 1959

Photoelectric observations of the stellar magnitude of Mars in five colors were made in October and November 1958 by means of the 21-in. reflector of the Lowell Observatory. Observations were made through a deep red filter and a silver filter. The effective wavelengths and bandwidths at half maximum response are listed, and the values are given for the energy curve of Mars after transmission through the atmosphere. (*AI/S*, 1960, #20,871)

148. OBSERVATIONS OF MARS IN 1958
de Vaucouleurs, G.
Sky and Telescope, v. 18, no. 9, pp. 484–489, July 1959

Photoelectric measurements of the integrated brightness and color of Mars and direct visual studies of surface and atmospheric details are described. (*AI/S*, 1959, #11,837)

149. MARS OBSERVATIONS WITH THE 8-IN. REFRACTOR OF THE ASTROPHYSICAL INSTITUTE DURING THE GREAT 1956 OPPOSITION
Fesenkov, V. G.
Akademiia nauk Kazakhskoi SSR, Alma-Ata, Astrofizicheskii institute, Izvestiia, v. 7, pp. 19–27, 1958 (in Russian with English abstract)
(*AJ*, 1958, #7418)

The subject of this study is primarily the brightness distribution at the outermost edge of the Mars disc. It is found that there the brightness diminishes faster than it should according to Lambert's law.

150. VISUAL MARS OBSERVATIONS DURING THE 1956 OPPOSITION
Koslova, K. I., Glagolevski, Y. V.
Akademiia nauk Kazakhskoi SSR, Trudy, sektor astrobotaniki, v. 6, pp. 7–22, 1958 (in Russian)
(*AJ*, 1958, #7431)

151. PHOTOMETRY OF PARTS OF THE MARS SURFACE IN 1956 WITH THE AFM-3 ELECTROPHOTOMETER
Glagolevski, Y. V., Koslova, K. I.
Akademiia nauk Kazakhskoi SSR, Trudy, sektor astrobotaniki, v. 6, pp. 197–207, 1958 (in Russian)
(*AJ*, 1958, #7420)

152. SOME PROPERTIES OF THE ATMOSPHERE OF MARS FROM SPECTROPHOTOMETRIC OBSERVATIONS IN 1956
Kozyrev, N. A.
Akademiia nauk SSSR, Krymskaia astrofizicheskaia observatoriia, Izvestiia, v. 18, pp. 61–65, 1958 (in Russian with English abstract)
(*AJ*, 1958, #7434)

In September 1956, a sharp decrease in contrast of the surface details of the planet was observed, with minor changes in the general color of the planet. From this, it was concluded that the turbidity of the Martian atmosphere occurred only in the bottom layers, with no essential changes taking place in the general optical properties of the atmosphere. A study of spectrograms of the polar cap, which was observed during the latter part of September and at the beginning of October 1956, indicated that this polar cap is an atmospheric structure. The polar cap is formed as a result of concentration of the particles which cause the normal scattering in the upper layers of the Martian atmosphere.

153. REZULTATELE PRELIMINARE ALE OBSERVATIILOR PLANETEI MARTE (PRELIMINARY RESULTS OF OBSERVATIONS OF THE PLANET MARS)
Barabashov, N. P.
Analele Romino-Sovietice, seria Matematica-Fizica, v. 12, pp. 142–144, 1958
(*AJ*, 1958, #7408)

154. PHOTOGRAPHIC PHOTOMETRY OF THE BRIGHT MARTIAN REGION ARGYRE IN AUGUST 1956
Rshanizyna, O. B.
Astronomicheskii Tsirkuliar, no. 191, pp. 9–11, 1958 (in Russian)
(*AJ*, 1958, #7422)

Although the brightness of the region was subject to fluctuations, it remained reddish in tone.

155. THE NATURE OF THE SURFACE AND ATMOSPHERE OF MARS ACCORDING TO 1956 OBSERVATION DATA
Sharonov, V. V.
Astronomicheskii Tsirkuliar, no. 195, pp. 7–8, 1958 (in Russian)
(*AJ*, 1958, #7450)

Brightness and color coefficients of various terrestrial specimens are compared with observations of details of the Mars surface. Evidently, there are wind-blown areas on the planet which are either swept clean of sand and dust, or in which the latter are heaped in such a way as to form very smooth planes. The latter is particularly applicable to the seas which are characterized by uniformity of color and gloss. The seas are considered as being the possible sources of the dust.

156. THE STRUCTURE OF THE SOUTHERN POLAR CAP OF MARS IN 1956
Barabashov, N. P., Koval, I. K.
Astronomicheskii Zhurnal, v. 35, pp. 261–264, 1958
Translated from the Russian in *Soviet Astronomy–AJ*, v. 2, pp. 234–238, 1958
(*AJ*, 1958, #7406)

The structure of the polar caps is discussed on the basis of observations made by various sources in the year 1956. The simultaneous disappearance of the southern polar cap on September 1, 1956, in the red as well as the ultraviolet light indicates the probability that the polar cap rested entirely on the solid surface of the planet at that time, and that the contrast in brightness between the cap and the rest of the Martian surface visible in various spectral regions can be explained by absorption (in addition to dispersion) properties of its atmosphere. An approximate estimate of the optical density of the Martian atmosphere in the ultraviolet light yields $\tau \approx 0.3$.

157. THE MAIN RESULTS OF OBSERVATIONS OF MARS DURING THE OPPOSITION OF 1956
Barabashov, N. P.
Astronomicheskii Zhurnal, v. 35, pp. 869–880, 1958
Translated from the Russian in *Soviet Astronomy–AJ*, v. 2, pp. 814–824, 1958
(*AJ*, 1958, #7407)

The most significant results of observations made during the 1956 Mars opposition at a number of Russian observatories and by the Astronomical Geodetic Society are discussed. The results include photographic, visual, photoelectric, and spectrophotometric observations. The causes of the disappearance of the southern polar cap between August 30 and September 14 are discussed, as well as the appearance of yellow-orange colored formations which for a long time covered various parts of the planet's surface. In addition, conclusions are drawn regarding the structure of the polar cap and the structure of the lands and the seas, as well as the absorption and scattering properties of the Martian atmosphere.

158. ÉTUDE DE LA PLANÈTE MARS AUX ÉTATS-UNIS EN 1956 (STUDY OF THE PLANET MARS IN THE UNITED STATES IN 1956)
Dollfus, A.
L'Astronomie, v. 72, pp. 315–327, 1958
(*AJ*, 1958, #7416)

159. ÉTUDE POLARIMÉTRIQUE ET PHOTOMÉTRIQUE DE LA CALOTTE POLAIRE ET DES RÉGIONS SOMBRES DE LA PLANÈTE MARS (POLARIMETRIC AND PHOTOMETRIC STUDY OF THE POLAR CAP AND THE DARK REGIONS OF THE PLANET MARS)
Focas, J. H.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 246, pp. 1665–1667, 1958
(See also *National Observatory of Athens*, Reprint 9, 1958)
(*AJ*, 1958, #7419)

The results of polarimetric and photometric measurements made during the Mars oppositions of 1954 and 1956 are presented in summarized form. In particular, the behavior of the clouds which rest above the polar region during the Martian winter is discussed. Also described are the brightness variations of the dark regions in polar and temperate latitudes during the course of the seasons.

160. VISUAL COMPARISON OF BRIGHTNESS AND COLOR OF THE MARS DISC WITH TERRESTRIAL DESERT FORMATIONS
Sharonov, V. V.
Leningrad Universitet, Uchenye Zapiski, no. 273, pp. 120–143, 1958 (in Russian)
(*AJ*, 1958, #7449)

161. SOME RESULTS OF THE MARS OBSERVATIONS DURING THE 1956 OPPOSITION
Sharonov, V. V.
Leningrad Universitet, Vestnik, no. 19, pp. 187–202, 1958 (in Russian with English abstract)
(*AJ*, 1958, #7451)

162. PHOTOMÉTRIE DE CERTAINES RÉGIONS DE MARS (PHOTOMETRY OF CERTAIN REGIONS ON MARS)
La Nature, v. 86, p. 292, 1958
(*AJ*, 1958, #7466)

163. PHOTOMETRIE DER MARS-MEERE (PHOTOMETRY OF THE MARS MARIA)
Naturwissenschaftliche Rundschau, v. 11, p. 148, 1958
(*AJ*, 1958, #7468)

164. OBSERVATION OF MARS AT THE 1956 OPPOSITION
Barabashov, N. P.
Pokroky matematiky, fysiky a astronomie, v. 3, pp. 606–609, 1958 (in Czechoslovakian)
(*AJ*, 1958, #7409)

165. THE RESULTS OF THE PHOTOMETRIC REDUCTION OF PHOTOGRAPHS OF MARS IN THE NEAR INFRARED SPECTRAL REGION
Butslov, M. M., Kaliniak, A. A., Kamionko, L. A.
Pulkovo, Astronomicheskaia observatoriia, Izvestiia, v. 21, no. 3 (162), pp. 63–71, 1958 (in Russian with English abstract)
(*AJ*, 1958, #7411)

The results of the photometric treatment of photographs of Mars, taken during the 1958 opposition at effective wavelengths of λ 8400 and 9830 A, are discussed. The absolute brightness of Mars, expressed in solar brightness units, amounts to 1.11×10^{-6} and 1.45×10^{-6} in the indicated wavelength regions. The brightness variations of Mars and the Moon in the spectral study agree with the results of Kuiper. The brightness, which is a function of the strong turbidity of the Martian atmosphere during the observational period, makes up about 20% of the total brightness in the average picture.

166. THE NEW IAU NOMENCLATURE FOR MARS
Ashbrook, J.
Sky and Telescope, v. 18, pp. 23–26, 1958
(*AJ*, 1958, #7403)

This is a report on the official nomenclature for 128 permanent dark and bright spots on the Mars surface, adopted by the IAU in 1958. This nomenclature should systematize the designations which thus far have not been uniform in many cases. Maps of Mars with and without names of the 128 areas are included.

167. COMMENTS ON N. A. KOZYREV'S ARTICLE ON "THE EXPLANATION OF THE COLOR OF MARS BY MEANS OF SPECTROSCOPIC PROPERTIES OF ITS ATMOSPHERE"
Tikhov, G. A.
Akademiia nauk Kazakhskoi SSR, Trudy, sektor astrobotaniki, v. 5, pp. 3–5, 1957 (in Russian)
(*AJ*, 1957, #7471)

168. RESULTS OF THE OBSERVATIONS OF MARS
Barabashov, N. P.
Akademiia nauk SSSR, Vestnik, no. 5, pp. 34–36, 1957 (in Russian)
(*AJ*, 1957, #7406)

169. ON THE BRIGHTNESS OF MARS
Young, A. T.
Astronomical Society of the Pacific, Publications of the, v. 69, pp. 568–570, 1957
(*AJ*, 1957, #7480)

An error in the central meridians used by Johnson and Gardiner is corrected, and the rotation light variation for 1954 is recomputed. The observations indicate an increase in the normal brightness of about 0.2 mag after January 10, 1954.

170. FURTHER RESULTS OF THE OBSERVATIONS OF MARS WITH THE AFM-3 ELECTROPHOTOMETER IN 1956

Glagolevski, Y. V., Koslova, K. I.
***Astronomicheskii Tsirkuliar*, no. 176, pp.2–4, 1957 (in Russian)**
(*AJ*, 1957, #7421)

Areas of 1′.6 × 2′.7 were measured at the center and at four locations three-fourths of the radius from the center of the Mars disc, using the 20-cm meniscus telescope at the Alma-Ata mountain station, at the effective wavelengths of 375, 405, 500, and 580 mμ. The brightness relationships between Syrtis Major and Hellas on October 9 and 13, and between the day and night sides from September 22 to October 13, are reported in tables and figures and discussed briefly. The color indexes determined by the Eggen system to an accuracy of ±0.04 mag are as follows: Syrtis Major +1.52 mag, and Hellas +1.61 mag (for the period October 9–13); day side +1.48 mag, and night side +1.59 mag (average of all observations). In other regions, the color index varies with time between +1.30 and +1.70 mag.

171. OBSERVATIONS OF MARS BY THE WAGO-EXPEDITION IN AUGUST AND SEPTEMBER 1956. REPORT I

Bronstein, V. A.
***Astronomicheskii Tsirkuliar*, no. 177, pp. 5–7, 1957 (in Russian)**
(*AJ*, 1957, #7407)

In August and September 1956, an expedition of the Astronomical Geodetic Society of the USSR observed Mars at the Observatory Planetarium of Stalingrad. At that time, 212 drawings in red, orange, green, and blue were made from data obtained with the 30-cm Zeiss refractor. This paper reports details about the dark edge of the melting south-polar cap and the abnormal phenomena in the southern hemisphere which appeared within a week and which may be attributable to powerful cyclonic activities in the Martian atmosphere. A relationship to solar activity may also exist.

172. OBSERVATIONS OF MARS BY THE WAGO-EXPEDITION IN AUGUST AND SEPTEMBER 1956

Bronstein, V. A.
***Astronomicheskii Tsirkuliar*, no. 178, pp. 10–11, 1957 (in Russian)**
(*AJ*, 1957, #7408)

This is a short report on the turbidity of the atmosphere in the southern hemisphere and on the brightness and color of the maria.

173. DETERMINATION OF THE COLOR OF THE MARS SEAS BY VISUAL COLORIMETRIC METHODS

Sharonov, V. V.
***Astronomicheskii Tsirkuliar*, no. 183, pp. 6–7, 1957 (in Russian)**
(*AJ*, 1957, #7460)

Color measurements at the edge of Sabaeus Sinus and Syrtis Major from August 28–September 2, 1956, confirm the concept that the greenish and bluish shading of the seas which can be observed visually through the telescope are not real but rather optical illusions.

174. THE COLOR OF THE MARS SURFACE AND THE COLOR CHARACTERISTICS OF ITS ATMOSPHERE

Barabashov, N. P.
***Astronomicheskii Tsirkuliar*, no. 183, pp. 7–9, 1957 (in Russian)**
(*AJ*, 1957, #7405)

In contrast to the recently expressed opinion that the Mars surface exhibits only a slight coloration, whereas its reddishness can be attributed to the properties of the atmosphere, the author proves on the basis of his color measurements during the opposition of 1956 that the Mars atmosphere has only a slight influence on the total color, and that this influence does not result in reddening but rather in a slight blue effect.

175. RECENT RESULTS OF VISUAL PHOTOMETRY AND COLORIMETRY OF MARS DURING THE 1956 OPPOSITION

Sharonov, V. V.
***Astronomicheskii Tsirkuliar*, no. 187, pp. 12–14, 1957 (in Russian)**
(*AJ*, 1957, #7461)

Mars was observed visually at Tashkend from August 12 through September 24, 1956, with a Rosenberg photometer. The reduced integral brightness averaged −1.83 mag, and the apparent albedo of the central portions was 0.184 for land and 0.105 for the maria. The color index of the integral light relative to the Sun averaged 1.07 mag.

176. THE RESULTS OF PHOTOGRAPHIC OBSERVATIONS OF MARS AT THE KHARKOV ASTRONOMICAL OBSERVATORY DURING 1954

Koval, I. K.

Astronomicheskii Zhurnal, v. 34, pp. 412–418, 1957
Translated from the Russian in *Soviet Astronomy–AJ*, v. 1, no. 3, pp. 404–410, May–June 1957
(*AJ*, 1957, #7436)

On the basis of the results of Mars observations which were carried out in four spectral regions with the 20-cm refractor at the Kharkov Observatory from June 1–September 10, 1954, it is concluded that: (1) Either the formulas of V. V. Sobolev or those of V. G. Fesenkov and E. Schoenberg can be applied with equal success in the analysis of the Mars observations. (2) The slope of the brightness-distribution curves decreases in the 560–660 $m\mu$ spectral region with the increase of the midday altitude of the Sun. (3) Close to opposition, the color of the seas differs very little from that of the continents. The seas of the lower southerly latitudes change their color with the changing midday altitude of the Sun. (4) The reflection of light on the surface of the seas does not follow Lambert's law. (5) The atmosphere over the seas is more transparent than that over the continents. (6) The southerly polar cap is reddish by comparison with a white cap.

177. THE ROLE OF TRUE ABSORPTION IN THE ATMOSPHERE OF MARS

Sharonov, V. V.

Astronomicheskii Zhurnal, v. 34, pp. 557–567, 1957
(in Russian with English abstract)
(*AJ*, 1957, #7462)

It is shown that if a "violet layer" existed in the Mars atmosphere, formed by particles which tend to absorb but do not scatter the radiation of the violet end of the spectrum, then concentrations of such particles would appear as dark rather than bright areas in violet photographs of the planet's disc. At present, all of these phenomena could be explained by the fact that the Martian atmosphere is considered purely scattering. It is therefore not necessary to assume the presence of any appreciable absorption in any layer of the atmosphere, particularly since it is difficult to find a gas or aerosol which could create the absorption with the required variation above the spectrum.

178. PHOTOELECTRIC PHOTOMETRY OF REGIONS ON THE SURFACE OF MARS

Moroz, V. I., Charitonov, A. V.

Astronomicheskii Zhurnal, v. 34, pp. 903–920, 1957
Translated from the Russian in *Soviet Astronomy–AJ*, v. 1, no. 6, pp. 874-890, November–December 1957
(*AJ*, 1957, #7499)

The observations were made in blue, yellow, and red light with the photoelectric photometer of the 50-cm Alma-Ata reflector during the 1956 opposition. A small diaphragm made it possible to mask out small portions of the surface of Mars. The brightness and color measurements of 37 such points were included in the Eggen system by using two comparison stars. From this, the albedo was also determined.

179. THREE-COLOUR COLORIMETRY OF THE INTEGRAL BRIGHTNESS OF MARS, ACCORDING TO OBSERVATIONS MADE IN 1956

Gurtovenko, E. A., Gordeladse, S. G.

Astronomicheskii Zhurnal, v. 34, pp. 959–961, 1957
Translated from the Russian in *Soviet Astronomy–AJ*, v. 1, no. 6, pp. 926–929, November–December 1957
(*AJ*, 1957, #7425)

Measurements made at 4300, 5461, and 6220 Å between September 1, 1956, and January 2, 1957, indicate that the great brightness of the planet during the opposition decreased considerably with increasing phase. Similarly, the color index decreased noticeably during the observation period.

180. COLOUR OBSERVATIONS OF MARS, SUMMER–AUTUMN 1956

Firsoff, V. A., Robinson, J. H.

British Astronomical Association, Journal of the, v. 67, pp. 320–324, 1957

181. PROPRIÉTÉS PHOTOMÉTRIQUES DES CONTRÉES DÉSERTIQUES SUR LA PLANÈTE MARS (PHOTOMETRIC PROPERTIES OF THE DESERT REGIONS ON THE PLANET MARS)

Dollfus, A.

***Comptes rendus hebdomadaires des séances de l'académie des sciences*, v. 244, pp. 162–164, 1957**
(*AJ*, 1957, #7414)

As a result of painstaking photometry in yellow light, in line with four stars, during the opposition of 1952, −1.88 mag was found to be the average brightness of the mean opposition. This corresponds to an albedo of 0.235 according to Russell-Bond. The brightness variations due to the passage of bright and dark regions were 0.4 mag. From measurements of the scattering coefficient on the Martian surface at various wavelengths, it is concluded that the ocher-colored desert areas (1) are very flat, and (2) are probably covered with fine dust, presumably consisting of iron oxide hydrates. Earlier polarization observations also indicate this to be the case.

182. ÉTUDE PHOTOMÉTRIQUE DES CONTRÉES SOMBRES DE LA SURFACE DE LA PLANÈTE MARS (PHOTOMETRIC STUDY OF THE DARK REGIONS ON THE SURFACE OF MARS)

Dollfus, A.
***Comptes rendus hebdomadaires des séances de l'académie des sciences*, v. 244, pp. 1458–1460, 1957**
(*AJ*, 1957, #7415)

The following additional result of the photometric and polarimetric observations made during the 1950 and 1952 oppositions is reported: The brightness of the Martian atmosphere decreases with wavelength less than λ^{-4} (pure gas). It therefore appears to be permeated by a mist consisting of extremely fine particles, which causes greater scattering of light. The dark regions deepen in grazing illumination, and the behavior of the brightness at various wavelengths is such as to indicate dust deposits on the ground. The seasonal variations in contrast and polarization of these regions are explained by the presence of microorganisms.

183. RESULTS OF MARS OBSERVATIONS

Lipski, Yu. N.
***Priroda*, v. 46, no. 4, pp. 105–106, 1957 (in Russian)**
(*AJ*, 1957, #7444)

A report is given concerning the 1956 conference of the Commission for Planetary Physics in Moscow at the Akademiia nauk SSSR. Barabashov reported on various observations and their development. Tikhov reported on further astrobotanical studies made by his group. Fesenkov discussed the results of photometric, colorimetric, and micrometric observations made at Alma-Ata. The contrast between bright and dark regions was markedly smaller in 1956 than in 1954. Barabashov and Kozyrev believe the polar caps to be mainly atmospheric formations. Kaliniak took Mars photographs in the infrared light with the aid of an image converter. The degree of polarization, according to Dzhapiashvili, was less than 0.5%. The problem of the abundance of water on Mars was studied by Lebedinski.

184. CONCERNING N. A. KOZYREV'S ARTICLE "EXPLANATION OF THE COLOUR OF MARS BY SPECTRAL PROPERTIES OF ITS ATMOSPHERE"

Tikhov, G. A.
***Akademiia nauk SSSR, Krymskaia astrofizicheskaia observatoriia, Izvestiia*, v. 16, pp. 159–161, 1956 (in Russian with English abstract)**
(*AJ*, 1956, #7477)

185. TRI-COLOR COLORIMETRY OF THE INTEGRAL BRIGHTNESS OF MARS DURING THE 1956 OPPOSITION

Gordeladse, S. G., Gurtovenko, E. A.
***Akademiia nauk URSR, Kiev, Holovna astronomichna observatoriia, Izvestiia*, v. 2, no. 2, pp. 140–154, 1956 (in Russian)**
(*AJ*, 1958, #7422)

Photographic photometric studies of Mars were made in Gollosseyevo from January 9, 1956, to February 1, 1957, in three spectral regions (430, 546, 622 $m\mu$). The greatest photovisual brightness obtained was $m_{pv} = -3.47$. From July 9 to February 1, it decreased to −1.02 mag. The color indexes decreased with the phase angle. Conclusions on the conditions of the Martian atmosphere are drawn with respect to these results.

186. THE FIRST RESULTS OF THE VISUAL OBSERVATIONS OF MARS DURING ITS GREAT OPPOSITION IN 1956

Koslova, K. I., Glagolevski, Y. V.
***Astronomicheskii Tsirkuliar*, no. 174, pp. 7–8, 1956 (in Russian)**
(*AJ*, 1956, #7433)

The observations took place between July 27 and October 10. The 21-cm meniscus telescope of Alma-Ata was used with four color filters. Marked changes took place in

the Mars atmosphere. The southern polar cap melted quickly and irregularly. The edge surrounding it was partially visible and partially invisible and varied in appearance. Bright spots occurred most frequently in the eastern portion of the southern hemisphere. Bright bands were observed only four times. The lands possessed the usual orange coloration. The dark areas were sharp at first; later they became weaker and faded, and then cleared again in the beginning of October.

187. VISUAL COLORIMETRY OF THE INTEGRAL BRIGHTNESS OF MARS IN 1956

Radlova, L. N.
***Astronomicheskii Tsirkuliar*, no. 174, p. 10, 1956**
(in Russian)
(*AJ*, 1956, #7462)

The observations were made with the aid of a visual Rosenberg star photometer in red and blue at the Gibe telescope of the Tashkend normal astrograph. The color of the extrafocal Martian image was compared with the color of the Sun reflected from a diffuse surface. This resulted in a color-index difference (6500/4800) of 1.56 mag average. The color index of the planet was also obtained, with reference to the King color-index catalog (1923). The author obtained a value of 1.88 mag, as compared to 2.07 mag for the year 1939.

188. PHOTOELECTRIC COLORIMETRY OF MARS

Shchegolev, D. E.
***Astronomicheskii Tsirkuliar*, no. 175, pp. 5–6, 1956**
(in Russian)
(*AJ*, 1956, #7468)

Using the Pulkovo meniscus telescope, color equivalents at 22 locations on the Mars disc were determined during conjunction with α Aur and β Gem on September 9 and 17, 1956, at wavelengths 520/460, 580/460, and 580/380 mμ/mμ.

189. ON THE DIFFERENCE OF THE PHOTOGRAPHIC DIAMETERS OF MARS IN RED AND VIOLET LIGHT

Barabashov, N. P., Koval, I. K.
***Astronomicheskii Zhurnal*, v. 33, pp. 890–892, 1956**
(in Russian with English abstract)
(*AJ*, 1956, #7404)

The decrease in the diameter of Mars photographs taken in the red and infrared regions is explained by the difference in brightness distribution in the various spectral regions on the Mars disc. In the red and infrared regions, the diameter depends upon the contrasting power of the photographic materials used (type of plate, developer). These phenomena have not been observed in the violet and ultraviolet regions.

190. THE SURFACE-TEMPERATURE CLIMATE OF MARS

Gifford, F., Jr.
***Astrophysical Journal*, v. 123, pp. 154–161, 1956**
(*AJ*, 1956, #7417)

Radiometric measurements of Mars, taken during various oppositions between 1926 and 1941, are discussed. Isothermal lines for the Mars surface and their seasonal variations are determined.

191. SOME RESULTS OF MARS OBSERVATIONS DURING THE OPPOSITION OF 1954

Koval, I. K.
***Kharkov Universitet, Astronomicheskaia observatoriia, Tsirkuliar*, no. 15, pp. 21–31, 1956**
(in Russian)
(*AJ*, 1956, #7435)

The author reports on the photometric measurements of numerous Mars photographs taken in Kharkov between May 16 and September 8, 1954, at effective wavelengths of 640, 580, 520, and 460 mμ. The albedo, the gloss factor, and the optical density of the atmosphere are derived for lands and seas, and the differences between them are discussed. According to these data, the Martian surface must possess a bluish shading; the apparent red coloration, however, must be caused by the atmosphere. The absorbing effect of the atmosphere is therefore significant.

192. RECENT INVESTIGATIONS OF THE ATMOSPHERE AND SURFACE OF MARS

Sytinskaya, N. N.
***Priroda*, v. 45, no. 6, pp. 33–41, 1956 (in Russian)**
(*AJ*, 1956, #7474)

A survey is presented of the problems involved in the investigation of Mars on the occasion of the 1956 opposition.

193. THE COLORS OF MARTIAN "VEGETATION"

Slater, A. E.
***Spaceflight*, v. 1, pp. 35–39, October 1956**

194. CURRENT ASTRONOMICAL PROBLEMS IN THE STUDY OF MARS AND OTHER PLANETS
Sharonov, V. V.
Akademiia nauk Kazakhskoi SSR, Trudy, sektor astrobotaniki, v. 4, pp. 55–61, 1955 (in Russian)
(*AJ*, 1957, #7018)

195. EXPLANATION OF THE COLOR OF MARS BY THE SPECTRAL PROPERTIES OF ITS ATMOSPHERE
Kozyrev, N. A.
Akademiia nauk SSSR, Krymskaia astrofizicheskaia observatoriia, Izvestiia, v. 15, pp. 147–152, 1955 (in Russian)
(*AJ*, 1955, #7414)

In the summer of 1954, spectrograms of Syrtis Major and the continent adjoining it in the west were taken at the Crimean Astrophysical Observatory with the 50-in. telescope and compared with spectrophotometric measurements of the Sun. The results indicated that the sea also possesses a red color and appears greenish only in contrast with the land. The main physical difference between them is a difference in reflectivity, the coloration being a result of the spectral properties of the atmosphere. It is only because of the large dust content of the atmosphere that a portion of the surface retains a reddish coloration.

196. THE MAGNITUDE AND COLOR OF MARS DURING THE 1954 OPPOSITION
Johnson, H. L., Gardiner, A. J.
Astronomical Society of the Pacific, Publications of the, v. 67, pp. 74–77, 1955
(*AJ*, 1955, #7413)

Photoelectric observations in the U, B, V-system, after application of the phase correction, showed a rotation light variation with an amplitude of about 0.1 mag and with simultaneous changes in the color index.

197. AN ATTEMPT AT A DIRECT VISUAL COLORIMETRIC COMPARISON OF MARS AND THE SUN
Sharonov, V. V.
Astronomicheskii Tsirkuliar, no. 161, pp. 13–14, 1955 (in Russian)
(*AJ*, 1955, #7429)

Using a method previously described by the author, Mars was observed colorimetrically during the opposition of 1954. Two series, using somewhat different methods, gave a color index relative to the Sun of 0.74 mag for June to the beginning of July and of 0.96 mag for the middle of July.

198. MONOCHROMATIC MAGNITUDES OF MARS IN 1954
Woolley, R. v. d. R., Gottlieb, K., Heintz, W., de Vaucouleurs, A.
Royal Astronomical Society, Monthly Notices of the, v. 115, pp. 57–59, 1955
(*AJ*, 1955, #7439)

On 40 nights during 1954, the monochromatic brightnesses of Mars were again determined from spectral images for seven wavelengths between 4050 and 6360 Å. From these, the monochromatic phase coefficients and the values of the spherical albedo were calculated. Although the new phase coefficients were as much as 38% lower than those found in 1952, the albedo rose again from 0.038 to 0.24 in this spectral region.

199. EVALUATION OF THE SUSPECTED EXISTENCE OF SALT REGIONS ON MARS FROM A PHOTOMETRIC VIEWPOINT
Sharonov, V. V.
Leningrad Universitet, Nauchnyi Biulleten, no. 32, pp. 4–6, 1954 (in Russian)
(*AJ*, 1954, #7432)

200. POLARIMETRIC OBSERVATIONS OF THE BRIGHT AND DARK AREAS OF MARS 1954
Focas, J. H.
National Observatory of Athens, Bulletin of the Astronomical Institute, no. 1, pp. 23–30, 1954
(*AJ*, 1958, #7402)

201. COMPARISON OF THE REFLECTIVITY OF THE "SEAS" OF MARS WITH THE SPECTRAL REFLECTIVITY OF SOME TERRESTRIAL PLANTS
Koslova, K. I.
Akademiia nauk Kazakhskoi, SSR, Vestnik, no. 4, pp. 84–89, 1953 (in Russian)
(*AJ*, 1953, #7407)

202. HETEROCHROMATIC PHOTOGRAPHY AND PHOTOMETRY OF MARS IN 1937 AND 1939
Martz, E. P., Jr.
Astronomical Journal, v. 58, pp. 221–222, 1953
(*AJ*, 1953, #7409)

203. ÉTUDE VISUELLE DE LA SURFACE DE LA PLANÈTE MARS AVEC UN POUVOIR SEPARATEUR 0.2 SEC (VISUAL STUDY OF THE SURFACE OF THE PLANET MARS WITH A SELECTIVITY OF 0.2 SEC)
Dollfus, A.
L'Astronomie, v. 67, pp. 85–106, 1953
(*AJ*, 1953)

204. MONOCHROMATIC MAGNITUDES OF MARS IN 1952
Woolley, R. v. d. R.
Royal Astronomical Society, Monthly Notices of the, v. 113, pp. 521–525, 1953
(*AJ*, 1953, #7419)

Monochromatic-brightness measurements at seven different wavelengths between λ4050 and λ6360 were made on spectra of the planet Mars. After reductions of the Sun–Mars and Mars–Earth unit distance, phase coefficients and surface albedo are computed.

205. COLOR PHOTOGRAPHS OF THE PLANET MARS
Klepešta, J.
Vesmir, v. 32, p. 133, 1953 (in Czechoslovakian)
(*AJ*, 1953, #7406)

206. THE MARS OPPOSITIONS
Barabashov, N. P.
Astronomicheskii Tsirkuliar, no. 126, pp. 20–21, 1952 (in Russian)
(*AJ*, 1952, #7405)

207. CONCERNING THE INVESTIGATION OF VARIOUS FORMATIONS ON MARS
Barabashov, N. P.
Astronomicheskii Zhurnal, v. 29, pp. 538–555, 1952 (in Russian)
(*AJ*, 1952, #7404)

The results are reported of visual and photographic Mars observations made during the past 30 years. Different parts of the maria possess different albedos and coloring. Certain dark areas must be moist portions of otherwise dry land. Color variations have not as yet been observed there, although they have been noted in a large number of sea areas; they become redder (bluer) as the midday elevation of the Sun decreases (increases). Blue and green colors must usually be interpreted as contrast effects to reds and whites. The existence of vegetation is possible. In the dry land areas, the albedo can attain 0.45 in red, but only 0.19 in yellow and in green. On the polar caps, reddish and bluish tints may be observed. The former are caused by the translucence of the underlying areas, the latter by high mists. The total humidity is concluded to be low. The atmosphere is probably often obfuscated by fine ice crystals.

208. SPECTROPHOTOMETRY OF MARS IN RED, YELLOW, GREEN, AND BLUE LIGHT
Barabashov, N. P., Chekirda, A. T.
Kharkov Universitet, Astronomicheskaia observatoriia, Tsirkuliar, no. 9, pp. 3–28, 1952 (in Russian)
(*AJ*, 1952, #7406)

As in earlier years, numerous photographs of Mars in four colors were taken in 1950 with the Moon–Sun camera at Kharkov. In this work, the 163 best exposures of 1939 and 1950 are used as a basis for photometric evaluation and discussion. Comparisons between the reflectivity of Martian areas and terrestrial samples lead to conclusions concerning the composition of certain Martian regions. Some dark areas are explained as being moist areas of otherwise dry ground. Different regions of the maria possess different albedos; certain portions of the continents reach 0.448 in the red. A reddish coloration of the polar cap may perhaps be explained by the translucence of the ocher-colored ground. Atmospheric turbidity is explained by fine ice crystals.

209. THE POSSIBILITY OF OBSERVING REFLECTIONS OF SUNLIGHT IN THE "SEAS" OF MARS
Barabashov, N. P.
Kharkov Universitet, Astronomicheskaia observatoriia, Tsirkuliar, no. 10, pp. 3–6, 1952 (in Russian)
(*AJ*, 1952, #7407)

In the last 40 years, only very few favorable occasions have occurred for the observation of the reflection of sunlight on regions with a possible moisture content. Therefore, the Fesenkov result concerning the lack of reflecting watery or moist areas larger than about 200 m in diameter should not be overrated.

210. DÉTERMINATION DE LA PRESSION ATMOSPHÉRIQUE SUR LA PLANÈTE MARS (DETERMINATION OF THE ATMOSPHERIC PRESSURE ON THE PLANET MARS)
Dollfus, A.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 232, pp. 1066–1068, 1951
(*AJ*, 1951, #7405)

On the Pic du Midi, under favorable observation conditions, measurements of the polarization of Mars' reflected light were carried out to determine the atmospheric surface pressure. In the absence of the violet veil, the variations in polarization from center to edge in different phases and colors result in a brightness condition from atmosphere to planetary surface of 0.037. From this, an air pressure of 83 mb is derived.

211. LA POLARISATION DE LA LUMIÈRE RENVOYÉE PAR LES DIFFÉRENTES RÉGIONS DE LA SURFACE DE LA PLANÈTE MARS ET SON INTÉRPRETATION (THE POLARIZATION OF THE LIGHT REFLECTED BY DIFFERENT REGIONS ON THE SURFACE OF MARS AND ITS INTERPRETATION)
Dollfus, A.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 233, pp. 467–469, 1951
(*AJ*, 1951, #7406)

Recent measurements have produced polarization curves of the Mars formations between the phases of 3 and 36 deg. The bright areas possess properties of polarized limestone. The dark areas differ from our vegetation-covered regions, with the possible exception of microscopic plants. The white clouds are crystalline. The violet mists are reminiscent of those on Venus. In the spring, the polar caps have the structure of sublimated hoarfrost.

212. RESULTS OF PHOTOMETRIC OBSERVATIONS IN 1933 AND 1939 OF PICTURES OF MARS OBTAINED WITH LIGHT FILTERS
Barabashov, N. P.
Kharkov Universitet, Astronomicheskaia observatoriia, Tsirkuliar, no. 8, pp. 3–12, 1951
(in Russian)
(*AJ*, 1951, #7403)

213. ON PHOTOMETRIC AND COLORIMETRIC NAKED-EYE OBSERVATIONS OF MARS
Pfannenschmidt, E.
Strolling Astronomer, v. 3, no. 11, pp. 1–2, 1949
(*AJ*, 1949, #7410)

214. PHOTOMETRIC INVESTIGATION OF THE PLANET MARS
Sytinskaya, N. N.
Leningrad University, Anniversary Publication, pp. 25–41, 1948 (in Russian)
(*AJ*, 1948, #7415)

215. ÉTUDE DE LA PLANÈTE MARS À L'OBSERVATOIRE DU PIC DU MIDI EN JANVIER 1946 (STUDY OF THE PLANET MARS AT THE PIC DU MIDI OBSERVATORY IN JANUARY 1946)
Dollfus, A.
L'Astronomie, v. 61, pp. 259–264, 1947
(*AJ*, 1947, #5504)

216. THE CHANGE IN COLOR OF THE MARS MARIA
Barabashov, N. P.
Kharkov Universitet, Astronomicheskaia observatoriia, Biulleten, no. 7, pp. 3–8, 1947
(in Russian)
(*AJ*, 1948, #7403)

217. THE ALBEDO OF THE LANDS AND SEAS OF MARS AND ITS ATMOSPHERE
Fedorets, V. A.
Kharkov Universitet, Astronomicheskaia observatoriia, Biulleten, no. 7, pp. 13–14, 1947
(*AJ*, 1948, #7406)

218. THE SPECTRAL REFLECTIVITY OF GREEN WITH RESPECT TO THE QUESTION OF VEGETATION ON MARS
Tikhov, G. A.
Vsesoiuznoe astronomo-geodezicheskoe obshchestvo, Biulleten, no. 1 (8), pp. 3–13, 1947
(in Russian)
(*AJ*, 1948, #7416)

219. LA FRANGE SOMBRE POLAIRE DE LA PLANÈTE MARS EN 1943 (THE DARK POLAR FRINGE OF THE PLANET MARS IN 1943)
Dollfus, A.
L'Astronomie, v. 60, pp. 132–134, 1946
(*AJ*, 1943–1946, #5506)

220. ON THE SURFACE AND ATMOSPHERE OF MARS
Barabashov, N. P.
Russkii astronomicheskii zhurnal, v. 23, pp. 321–331, 1946 (in Russian with English abstract)
(*AJ*, 1943–1946, #5503)

In 1933, the albedo on Martian surface regions was found to be between 0.22 and 0.16 (0.17 and 0.15; 0.10 and 0.06) at $\lambda_1 = 640$ mμ (560 mμ, 461 mμ). In 1939, similar values were obtained. The color of Syrtis Major fluctuates periodically.

221. THE NATURE OF THE SURFACE AND THE ATMOSPHERE OF THE PLANET MARS AS DETERMINED BY ABSOLUTE PHOTOMETRIC MEASUREMENTS
Sytinskaya, N. N.
Akademiia nauk SSSR, Doklady, v. 43, pp. 151–154, 1944 (in Russian)
(*AJ*, 1943–1946, #5515)

222. THE NATURE OF THE SURFACE AND ATMOSPHERE OF MARS
Fesenkov, V. G.
Russkii astronomicheskii zhurnal, v. 21, pp. 257–275, 1944 (in Russian)
(*AJ*, 1943–1946, #5507)

223. THE BRIGHTNESS CONTRASTS OBSERVED ON THE SURFACE OF MARS
Sharonov, V. V.
Pulkovo, Astronomicheskaia observatoriia, Tsirkuliar, v. 32, pp. 62–73, 1943 (in Russian with English abstract)
(*AJ*, 1943, #5514)

During the 1939 opposition, photographs with color filters were taken in Tashkend which confirmed earlier observations about the reddish-brown and gray surface areas (reddish desert sands or gray earth). The observations can be interpreted even better in the above sense if one assumes an atmosphere with Rayleigh scattering, whose density, in a homogeneous layer, would be approximately 3 km at a pressure of 760 mm. This would result in a pressure of 90 mm on Mars.

224. THE REFLECTION OF THE LIGHT FROM THE SURFACE OF THE MOON AND MARS
Barabashov, N. P., Chekirda, A. T.
Russkii astronomicheskii zhurnal, v. 22, pp. 11–22, 1943 (in Russian)
(*AJ*, 1943, #5403)

225. PHOTOMETRICAL AND COLORIMETRICAL OBSERVATIONS OF MARS DURING THE OPPOSITION OF 1939
Radlova, L. N.
Russkii astronomicheskii zhurnal, v. 17, no. 4, pp. 30–36, 1940 (in Russian with English abstract)
(*AJ*, 1940, #5509)

Observations of Mars during the 1939 opposition were made in Tashkend with the aid of a Rosenberg photometer which was attached to the visual duct of the normal astrograph. The results were: brightness of Mars = −1.84, color index = +2.06, albedo = 0.153. A comparison of the albedos of terrestrial stone, sand, and clay shows the dissimilarity between the planet Mars and the Earth.

226. PHOTOGRAPHIC OBSERVATIONS OF MARS AT THE OPPOSITION OF 1939
Sharonov, V. V.
Russkii astronomicheskii zhurnal, v. 17, no. 4, pp. 37–39, 1940 (in Russian with English abstract)
(*AJ*, 1940, #5511)

Photographs of Mars, taken at Tashkend in June and July 1939 with various plates and color filters in the ultraviolet, violet, green, red, and infrared, are discussed.

227. PHOTOGRAPHIC PHOTOMETRY OF MARS IN RED AND BLUE RAYS
Barabashov, N. P., Timoshenko, I.
Russkii astronomicheskii zhurnal, v. 17, no. 5, pp. 44–53, 1940 (in Russian with English abstract)
(*AJ*, 1940, #5503)

The brightness distribution on Mars is determined in red and blue light from pictures taken with the 8-in. refractor of the Kharkov University Observatory.

228. OBSERVATIONS COLORIMÉTRIQUES DE MARS ET VÉNUS (COLORIMETRIC OBSERVATIONS OF MARS AND VENUS)
Oriano, G.
L'Astronomie, v. 52, pp. 400–404, 1938
(*AJ*, 1938, #5212)

Color estimates of Mars and Venus made during the conjunction in May 1938 are presented.

229. RESOLVING POWER IN PLANETARY PHOTOGRAPHS DETERMINED FROM PHOTOMETRY OF THE IMAGE EDGE
Edson, J. B.
Astronomical Society of the Pacific, Publications of the, v. 49, pp. 281–282, 1937
(*AJ*, 1937, #5505)

Is the apparent width of the Martian canals in photographs a photographic effect, or is it real?

230. THE BRIGHTNESS RATIO OF THE CENTRAL REGIONS OF THE MARS AND JUPITER DISCS
Barabashov, N. P., Semeykin, B. E.
Russkii astronomicheskii zhurnal, v. 12, pp. 337–338, 1935 (in Russian)
(*AJ*, 1935, #5503)

Pictures of Jupiter and Mars were taken with blue, yellow, and red filters. In blue light, the central region of the Jupiter disc reflects 11 times more light than the corresponding region of Mars. With the yellow filter, this ratio becomes twice, and with the red almost three times as small.

231. THE PHOTOGRAPHIC PHOTOMETRY OF MARS IN DIFFERENT RAYS
Barabashov, N. P., Semeykin, B. E.
Russkii astronomicheskii zhurnal, v. 11, pp. 215–224, 1934 (in Russian with English abstract)
(*AJ*, 1934, #5507)

The results of this work are as follows: Lambert's law cannot represent the observed intensity if light absorption and diffusion in the planetary atmosphere are not taken into account. The effect of the latter is calculated, using Schoenberg's formulas. The albedo of Mars is reduced with decreasing wavelength. The diffusion constant given by the law $\sim\lambda^{-4}$ and an estimate of the air pressure on the surface of Mars (approximately 30–40 mm) are presented. In conclusion, information is given about the albedos of individual portions of the planet's surface.

232. PHOTOMETRISCHE UNTERSUCHUNG DER MARSOBERFLÄCHE UND SEINER ATMOSPHÄRE DURCH FARBFILTER (PHOTOMETRIC INVESTIGATION OF THE SURFACE OF MARS AND ITS ATMOSPHERE WITH COLOR FILTERS)
Barabashov, N. P., Semeykin, B. E.
Zeitschrift für Astrophysik, v. 8, pp. 44–55, 1934
(*AJ*, 1934, #5506)

Studies of the photographic images indicate: (1) Lambert's law is valid for Mars' surface; (2) the transmission coefficients of the atmosphere for red, yellow, and blue are, respectively, 0.983, 0.905, and 0.427; (3) for red and yellow radiation, Rayleigh's scattering law is valid; for blue, there are large deviations.

233. ZEICHNUNGEN UND FARBENSTUDIEN DES PLANETEN MARS AM SIEBENZÖLLIGEN EKVATOREALE DER STERNWARTE ZU STOCKHOLM (DRAWINGS AND COLOR STUDIES OF THE PLANET MARS AT THE SEVEN-INCH EQUATORIAL OF THE STOCKHOLM OBSERVATORY)
Bohlin, K.
Astronomiska iakttagelser och undersökningar å Stockholms Observatorium, v. 11, no. 6, 1929
(*AJ*, 1929, #5506a)

Observations and drawings were made in 1924 and 1926 in an attempt to explain the yellow border around the disc.

234. OBSERVATIONS OF MARS IN 1926
Barabashov, N. P.
Kharkov Universitet, Astronomicheskaia observatoriia, Publikatsii, v. 2, pp. 17–25, 1928
(*AJ*, 1928, #5511)

From observations, N. P. Barabashov made 82 sketches of the planet and B. Semeykin, 39. On the basis of each

series of drawings, two special maps of Mars were prepared. The visibility of the canals in the years 1920, 1924, and 1926 is represented in the form of a table.

235. MARSBEOBACHTUNGEN MIT FARBFILTERN. VORLÄUFIGE MITTEILUNG (MARS OBSERVATIONS WITH COLOR FILTERS. TENTATIVE REPORT)
Barabashov, N. P.
Astronomische Nachrichten, v. 230, pp. 49–54, 1927
(*AJ*, 1927, #5506)

Visual observations made with color filters (red 605–660 $\mu\mu$, yellow 535–595 $\mu\mu$, green 475–530 $\mu\mu$, violet 395–425 $\mu\mu$) are described. The details appear quite different as reproduced in the filtered light; the violet, particularly, reveals numerous bright spots not otherwise visible. Observations of these spots are reported, and the assumption is made that they are cloud formations.

236. HELLIGKEITSVERHÄLTNISSE DER MARSOBERFLÄCHE NACH MOUNT WILSON-AUFNAHMEN (BRIGHTNESS RATIOS OF THE MARS SURFACE ACCORDING TO MOUNT WILSON PHOTOGRAPHS)
Götz, P.
Astronomische Nachrichten, v. 230, pp. 145–152, 1927
(*AJ*, 1927, #5512)

In order to derive the density curve, a wedge-shaped curve was superimposed on four photographs of Mars. The relative brightness values for 39 points on the surface were computed by order of magnitude.

237. FURTHER RADIOMETRIC MEASUREMENTS AND TEMPERATURE ESTIMATES OF THE PLANET MARS, 1926
Coblentz, W. W., Lampland, C. O.
National Bureau of Standards, Journal of Research, v. 22, pp. 237–276, 1927
(*AJ*, 1928, #5507)

238. ON THE ATMOSPHERE OF MARS; PHOTOMETRIC ANALYSIS OF WRIGHT'S PHENOMENON
Fesenkov, V. G.
Astronomische Nachrichten, v. 228, pp. 25–32, 1926
(*AJ*, 1926, #5505)

An attempt is made to determine, by theoretical means, a Martian atmospheric composition which is in accord with the phenomena discovered by Wright in 1924 in the photographs of Mars taken with monochromatic light. An Earth-type atmosphere (transmission coefficient p near 1) is not conceivable, since it would make the enlargement of the ultraviolet pictures impossible. However, this phenomenon could be explained by assuming that dust particles exist at great altitudes in the Martian atmosphere and that the values of p are small in the ultraviolet and large in the infrared.

239. AN ATTEMPT TO DETECT WATER-VAPOR AND OXYGEN LINES IN THE SPECTRUM OF MARS WITH THE REGISTERING MICROPHOTOMETER
Adams, W. S., St. John, C. E.
Astrophysical Journal, v. 63, pp. 133–137, 1926
(*AJ*, 1926, #5502)

One spectrogram was taken of Mars and one of the [Earth] sky with a high-dispersion spectrograph. The line displacement showed the water-vapor content in the Martian atmosphere to be 3% of that of the air over Pasadena and 6% of that over Mt. Wilson; therefore, using the beginning of Martian spring as a reference point, it may be concluded that a desert climate reigns over extensive areas of Mars. The oxygen content was found to be 16% of that over Mt. Wilson, or two-thirds of that over Mt. Everest.

240. VARIATIONS OF THE POLARIZATION OF MARS IN THE COURSE OF AN ATMOSPHERIC DISTURBANCE
Lyot, B.
Comptes rendus hebdomadaires des séances de l'académie des sciences, June 2, 1925 (in French)
(*AJ*, 1925, #5517)

MERCURY

Periodicals

241. THE BRIGHTNESS OF MERCURY AT ITS GREATEST ELONGATIONS
Heath, M. B. B.
British Astronomical Association, Journal of the, v. 68, pp. 30–32, 1958
(***AJ,*** 1958, #7103)

On the basis of Müller's formula, the problem of maximum and minimum brightness of the planet at its greatest elongation is discussed, and the ratios are illustrated with a drawing.

242. MAGNITUDE ET ALBEDO VISUELS DE LA PLANÈTE MERCURE. RECTIFICATIF (APPARENT MAGNITUDE AND ALBEDO OF MERCURY. REVISED)
Danjon, A.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 238, pp. 1371–1372, 1954
(***AJ,*** 1954, #7101)

Corrections are given for the article in *Comptes rendus hebdomadaires des séances de l'académie des sciences,* v. 227, p. 652, 1948.

243. OBSERVATION VISUELLE ET PHOTOGRAPHIQUE DES PLANÈTES MERCURE ET VÉNUS À L'OBSERVATOIRE DU PIC DU MIDI (VISUAL AND PHOTOGRAPHIC OBSERVATION OF THE PLANETS MERCURY AND VENUS AT THE PIC DU MIDI OBSERVATORY)
Dollfus, A.
L'Astronomie, v. 67, pp. 61–75, 1953
(***AJ,*** 1953, #7102)

244. PHOTOMÉTRIE ET COLORIMÉTRIE DES PLANÈTES MERCURE ET VÉNUS (PHOTOMETRY AND COLORIMETRY OF THE PLANETS MERCURY AND VENUS)
Danjon, A.
Bulletin astronomique, v. 15, p. 105, 1950
(***AJ,*** 1950, #7103)

On the basis of an improved visual solar-brightness value of −26.86 mag, values of 0.055 and 0.64, respectively, are derived for the apparent albedos of Mercury and Venus.

245. ALBEDOS DES PLANÈTES MERCURE ET VÉNUS: VALEURS CORRIGÉES (ALBEDOS OF THE PLANETS MERCURY AND VENUS: CORRECTED VALUES)
Danjon, A.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 230, p. 1011, 1950
(***AJ,*** 1950, #7104)

246. OBSERVATION D'UNE ATMOSPHÈRE AUTOUR DE LA PLANÈTE MERCURE (OBSERVATION OF AN ATMOSPHERE AROUND THE PLANET MERCURY)
Dollfus, A.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 231, pp. 1430–1432, 1950
(***AJ,*** 1950, #7105)

Polarization measurements in the dark and light regions of the surface of Mercury show that, as on the Moon, the strength of polarization varies, in the inverse sense, like that of the albedo. Differences between the polarization in the red and in the green are explained as effects of a weak atmosphere whose density, assuming equal composition, is about 3/1000 of the Earth's atmosphere.

247. PHOTOMÉTRIE ET COLORIMÉTRIE DES PLANÈTES MERCURE ET VÉNUS (PHOTOMETRY AND COLORIMETRY OF THE PLANETS MERCURY AND VENUS)
Danjon, A.
Bulletin astronomique, v. 14, pp. 315–345, 1949
(***AJ,*** 1949, #7103)

The photometer, its mounting, and the color filters are described with which the two inner planets were compared with the Sun during the day at the highest possible elevation. The provisional scale was calibrated with the aid of eight bright fixed stars. 335 observations of Venus between the phase angles of 0.9 and 170.7 deg, and 225 measurements of Mercury between 2.9 and 123.1 deg make it possible to establish the apparent brightness of the planet (reduced to $r = \Delta = 1$) as a third-order function of the phase angle. The color index is found to be 1.00 mag for both planets, and the visual and photographic albedos are 0.73 and 0.60 for Venus and 0.063

and 0.052 for Mercury. Comparison is made with previous observations. Mercury is compared with the Moon, and an application of its brightness function to the conditions of visibility during a synodic period is demonstrated.

248. HELLIGKEIT UND PHASENKURVE DES PLANETEN MERKUR NACH BEOBACHTUNGEN IN SÜDWESTAFRIKA (BRIGHTNESS AND PHASE CURVE OF THE PLANET MERCURY ACCORDING TO OBSERVATIONS MADE IN SOUTHWEST AFRICA)
Hoffmeister, C.
Astronomische Nachrichten, v. 270, pp. 167–170, 1940
(*AJ*, 1940, #5207)

Observations obtained under favorable atmospheric conditions are reduced by two methods: (1) application of the average night extinction values derived from other observations; (2) determination of the extinction magnitude from comparisons of the planet with stars at various zenith distances. The results indicate that the decrease in light at the horizon is greater than the average night value in the evening and smaller in the morning. With respect to the phase curve and brightness of Mercury, the results obtained by other authors for the 55- to 122-deg phase-angle region were confirmed. On the other hand, the observations made between 35 and 55 deg show a thus far unexplained deviation from the linear phase law in the direction of lesser brightness.

249. PHOTOMÉTRIE DES PLANÈTES MERCURE ET VÉNUS (PHOTOMETRY OF THE PLANETS MERCURY AND VENUS)
Danjon, A.
Journal de physique et le radium, v. 10 (7) pp. 112–113, 1939
(*AJ*, 1939, #5201)

250. PHOTOMETRISCHE PHASENKURVE DES PLANETEN MERKUR (PHOTOMETRIC PHASE CURVE OF THE PLANET MERCURY)
Graff, K.
Sitzungsberichte der Akademie der Wissenschaften, mathematisch-naturwissenschafliche Klasse (2a), Vienna, v. 148, pp. 41–48, 1939
(*AJ*, 1939, #5202)

This paper discusses 140 photometric observations of Mercury made in Porto Cristo and Arenal on Mallorca with a circular-wedge photometer constructed by the author. Contrary to Hopmann's findings, the brightness of the planets was in good agreement with the studies made by Schmidt (Athens) and G. Müller (Potsdam).

251. LA POLARISATION DE MERCURE COMPARÉE À CELLE DE LA LUNE: RÉSULTATS OBTENUS AU PIC DU MIDI EN 1930 (THE POLARIZATION OF MERCURY COMPARED WITH THAT OF THE MOON: RESULTS OBTAINED AT THE PIC DU MIDI IN 1930)
Lyot, B.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 191, pp. 703–706, 1930
(*AJ*, 1930, #5205)

252. POLARISATION DE LA PLANÈTE MERCURE (POLARIZATION OF THE PLANET MERCURY)
Lyot, B.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 189, pp. 425–426, 1929
(*AJ*, 1929, #5209a)

Earlier observations of Mercury from Meudon are repeated, this time at the Pic du Midi. It is proved that the ratios of polarized light of Mercury (observed during the night) near its greatest elongation go through the same series of values as do those of polarized moonlight, and correspond to the same phases. The accuracy of the results is a good indication of the advantage of making astronomical observations from high mountains.

LUNAR ECLIPSES

253. PHOTOGRAPHIC PHOTOMETRY OF THE PENUMBRA DURING THE LUNAR ECLIPSE OF 13–14 MARCH
Torelli, M.
Atti della accademia nazionale dei Lincei, Rendiconti, Classe di scienze fisiche, matematiche e naturali, v. 28, no. 1, pp. 50–56, January 1960 (in Italian)

A comparison of the results with Link's theory shows that there is an excess luminosity. (*PA*, 1960, #10,492)

254. PHOTOGRAPHIC PHOTOMETRY OF THE PENUMBRA OF THE LUNAR ECLIPSES OF MAY 13 AND NOVEMBER 7, 1957
Poloshenzeva, T. A.., Bronnikova, N. M.
Astronomicheskii Tsirkuliar, no. 194, pp. 10–11, 1958 (in Russian)
(*AJ*, 1958, #7364)

255. THE TOTAL LUNAR ECLIPSE OF NOVEMBER 7, 1957
Chistiakov, V. F.
Astronomicheskii Tsirkuliar, no. 187, pp. 11–12, 1957 (in Russian)
(*AJ*, 1957)

This paper presents estimates of the integral brightness and of some color effects.

256. FOTOMETRIA FOTOELETTRICA DELL' ECLISSE TOTALE DI LUNA DEL 13–14 MAGGIO 1957 (PHOTOELECTRIC PHOTOMETRY OF THE TOTAL ECLIPSE OF THE MOON OF MAY 13–14, 1957)
Cimino, M., Fresa, A.
Atti della accademia nazionale dei Lincei, Rendiconti, Classe di scienze fisiche, matematiche e naturali, (8) v. 25, pp. 58–64, 1958
(*AJ*, 1958, #7363)

During the eclipse of May 14, 1957, four objects on the lunar surface were observed photoelectrically in order to test the theory suggested by Link.

257. PHOTOGRAPHIC PHOTOMETRY OF THE TOTAL LUNAR ECLIPSE OF MAY 13–14, 1957 IN RED LIGHT
Koslova, K. I., Suslov, A. K.
Astronomicheskii Tsirkuliar, no. 184, pp. 12–14, 1957 (in Russian)
(*AJ*, 1957)

Fifty points on the lunar surface were observed photometrically at 640 mμ during normal phase and during the eclipse. It was found that the brightness distribution of the details was very different during the totality than during normal phase.

258. PHOTOMETRIC OBSERVATIONS OF THE LUNAR ECLIPSE OF MAY 13–14, 1957
Radlova, L. N., Sharonov, V. V.
Astronomicheskii Tsirkuliar, no. 184, pp. 11–12, 1957 (in Russian)
(*AJ*, 1957)

From visual observations made in Odessa of three points on the lunar surface, the curve of the eclipse was determined.

259. L'ÉCLIPSE TOTALE DE LUNE DU 13–14 MAI 1957 (THE TOTAL ECLIPSE OF THE MOON OF MAY 13–14, 1957)
Fluckiger, M.
Orion, v. 5, pp. 317–321, 1957
(*AJ*, 1957)

Observations made in Lausanne of the total lunar eclipse of May 13–14, 1957 are reported. These observations include brightness measurements made with a selenium cell and photographs taken during various phases.

260. ÉTUDE DE LA VARIATION DE LUMINOSITÉ NOCTURNE AU COURSE DE L'ÉCLIPSE TOTALE DE LUNE DU 18 NOVEMBRE 1956 (STUDY OF THE CHANGE IN NOCTURNAL LUMINOSITY DURING THE TOTAL ECLIPSE OF THE MOON OF NOVEMBER 18, 1956)
Legrand, J. P., Meunier, R., Bonpas, M.
L'Astronomie, v. 71, pp. 353–355, 1957
(*AJ*, 1957)

261. L'ÉCLIPSE TOTALE DE LUNE DU 18 NOVEMBRE 1956 (TOTAL LUNAR ECLIPSE OF NOVEMBER 18, 1956)
Dubois, J., Rousseau, M.
L'Astronomie, v. 70, pp. 414–415, 1956
(*AJ*, 1956, #7343)

262. PHOTOMETRIC OBSERVATIONS OF THE LUNAR ECLIPSE OF NOVEMBER 17–18, 1956
Bruner, E. C., Jr.
November 20, 1958
Naval Ordnance Test Station, China Lake, Calif.
NOTS-TP-2142, NAVORD-R-6436
(See also *Astronomical Society of the Pacific, Publications of the*, v. 69, no. 410, pp. 431–435, October 1957)

Brightness measurements of the lunar disc were made at two wavelength intervals, centered at λ5458 and λ6230, during the lunar eclipse of November 17–18, 1956. The present measurements indicate that at the center of totality, the brightness in the green changed by 11.4 mag and in the red by 10.8 mag from that of the uneclipsed Moon.

263. PHOTOGRAPHIC PHOTOMETRY OF THE PARTIAL LUNAR ECLIPSE OF MAY 24, 1956 IN RED LIGHT
Koslova, K. I., Suslov, A. K., Glagolevski, Y. V.
Astronomicheskii Tsirkuliar, no. 173, pp. 6–7, 1956
(*AJ*, 1956)

The decrease in brightness as a function of distance from the center of the shadow is determined for the second half of the eclipse, using panchromatic photographs on Agfa astro-plates taken with a red filter at the Bredikhin astrograph in Alma-Alta. The transition from umbra to penumbra amounts to about 5 mag.

264. OBSERVATIONS OF THE TOTAL LUNAR ECLIPSE OF MAY 24, 1956
Fesenkov, V. G.
Astronomicheskii Tsirkuliar, no. 172, p. 19, 1956
(in Russian)
(*AJ*, 1956)

265. PHOTOGRAPHIC PHOTOMETRY OF THE PENUMBRA OF THE LUNAR ECLIPSE OF NOVEMBER 29, 1955
Poloshenzeva, T. A., Shchegolev, D. E.
Astronomicheskii Tsirkuliar, no. 177, p. 10, 1957
(in Russian)
(*AJ*, 1957, #7337)

266. OBSERVATIONS OF THE LUNAR ECLIPSE OF NOVEMBER 29, 1955, AT THE ASTRONOMICAL OBSERVATORY OF LENINGRAD UNIVERSITY
Sharonov, V. V., Orlova, N. S., Kodachenko, M. V.
Astronomicheskii Tsirkuliar, no. 171, pp. 7–10, 1956 (in Russian)
(*AJ*, 1956)

This is a report on the course of the eclipse in general as observed in Leningrad, the visual photometry of the penumbra, visual integral photometry, and brightness measurements made with a lightmeter.

267. MESURES PHOTOELÉCTRIQUES DES ÉCLIPSES DE LA LUNE PAR LA PÉNOMBRE (PHOTOELECTRIC MEASUREMENTS OF THE LUNAR ECLIPSE [JULY 15–16, 1954] THROUGH THE PENUMBRA)
Atanasiyević, I. M.
Bulletin de la société des mathématiciens et physiciens de la R. P. de Serbie, v. 8, pp. 211–214, 1956 (in Serbian with French abstract)
(*AJ*, 1956, #7340)

268. SUR LA VARIATION DE LA PROPORTION DE LUMIÈRE POLARISÉE DANS LA PÉNOMBRE, AU COURS DE L'ÉCLIPSE PARTIELLE DE LUNE, DU 15–16 JUILLET 1954 (THE VARIATION OF THE PROPORTION OF POLARIZED LIGHT IN THE PENUMBRA DURING THE PARTIAL LUNAR ECLIPSE OF JULY 15–16, 1954)
Focas, J. H.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 243, pp. 1490–1493, 1956
(*AJ*, 1956)

During the eclipse, the proportion of polarized light (as well as the direction of the polarizing plane) in the penumbral region is measured with a Lyot polarimeter. The polarization varies greatly with the distance from the center of the umbra and disappears at its edge.

269. FOTOMETRIA FOTOGRAFICA DELLA PENOMBRA DURANTE L'ECLISSE DI LUNA DEL 15–16 LUGLIO 1954 E LUMINESCENZA DEL SUOLO LUNARE (PHOTOMETRIC PHOTOGRAPHY OF THE PENUMBRA DURING THE LUNAR ECLIPSE OF JULY 15–16, 1954, AND LUMINESCENCE OF THE LUNAR SURFACE)
Fortini, T.
Atti della accademia nazionale dei Lincei, Rendiconti, Classe di scienza fisiche, matematiche e naturali, v. 18 (8), pp. 65–69, 1955
(*AJ*, 1955)

The lunar eclipse of July 15–16, 1954, was photographed using the same technique as in 1953 and 1954, so that a homogeneous sequence of lunar eclipse observations could be obtained. The data obtained should prove Link's theory as applied to solar activity as well.

270. POLARIMETRIC AND PHOTOGRAPHIC OBSERVATIONS OF THE PENUMBRA DURING THE PARTIAL ECLIPSE OF THE MOON OF JULY 15–16, 1954
Focas, J. H.
National Observatory of Athens, Bulletin of the Astronomical Institute, no. 1, pp. 20–22, 1954
(*AJ*, 1958, #7362)

271. OBSERVATION DE L'ÉCLIPSE TOTALE DE LUNE DU 18–19 JANVIER 1954 (OBSERVATION OF THE TOTAL ECLIPSE OF THE MOON OF JANUARY 18–19, 1954)
Golay, M.
Publications de l'observatoire de Genève, (A), v. 6, pp. 15–18, 1955
(*AJ*, 1955)

The decrease in brightness from the edge toward the center of the Moon is determined from photographs of the eclipsed Moon between wavelengths of 5600 and 6100 Å, by means of photometry of a predetermined rectangular strip. The course of this curve is steepest when the Moon is closest to the edge of the Earth's shadow. The fact that this lunar eclipse can be classified in the Danjon scale with respect to its general brightness confirms the connection between the brightness of the eclipsed Moon and solar activity.

272. FOTOMETRIA FOTOGRAFICA DELL'ECLISSE TOTALE DI LUNA DEL 18–19 GENNAIO 1954 IN RELAZIONE AL PROBLEMA DELLA LUMINESCENZA DEL SUOLO LUNARE (PHOTOGRAPHIC PHOTOMETRY OF THE TOTAL ECLIPSE OF THE MOON OF JANUARY 18–19, 1954, IN RELATION TO THE PROBLEM OF LUNAR-SURFACE LUMINESCENCE)
Fortini, T.
Atti della accademia nazionale dei Lincei, Rendiconti, Classe de scienze fisiche, matematiche e naturali, v. 17 (8) pp. 209–215, 1954
(*AJ*, 1954)

During the total eclipse of the Moon of January 18–19, 1954, a large number of photographs were taken in the 6300 Å region. These were evaluated photometrically in order to determine shadow densities in the penumbra and umbra regions. Curves of the snadow densities are shown, with their distances from the edge of the shadow, and compared with those computed according to Link's theory. Conclusions are drawn from the deviations with respect to the contribution of radiation by the corona on the one hand and the composition of the upper layers of the Earth's atmosphere on the other.

273. PHOTOELECTRIC PHOTOMETRY OF THE LUNAR ECLIPSE OF JULY 26, 1953
Walker, M. F., Reaves, G.
Astronomical Society of the Pacific, Publications of the, v. 69, pp. 153–157, 1957

One of the most serious problems in the photometry of a lunar eclipse is that the measurements of the brightness of a particular area of the Moon's surface that is being followed through the Earth's shadow may be affected, when this area is within the umbra, by light scattered by the uneclipsed lunar surface. Observations of the first half of the total lunar eclipse of July 26, 1953 were undertaken in an attempt to overcome this difficulty by following the trailing limb of the Moon into the Earth's shadow. In this way, the area under observation is nearly the brightest area of the Moon, and the effect of scattered light is minimized.

274. PHOTOMÉTRIE DE L'ÉCLIPSE DE LUNE DE JANVIER 1953 (PHOTOMETRY OF THE LUNAR ECLIPSE OF JANUARY 1953)
Vigroux, E.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 239, pp. 227–229, 1954 (*AJ*, 1954)

The shadow density in the visual region was derived from spectral photographs taken during the 1953 eclipse. In addition to a number of bands of O_3, two O_2 bands at 6300 and 5780 Å were confirmed by the curves, as well as an absorption below 5600 Å which remains nearly constant to 4700 Å.

275. PHOTOMÉTRIE D'UNE ÉCLIPSE DE LUNE. RÉPARTITION DE L'OZONE (PHOTOMETRY OF A LUNAR ECLIPSE. OZONE DISTRIBUTION)
Vigroux, E.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 239, pp. 339–341, 1954 (*AJ*, 1954)

Measurements of the shadow density of the Moon during the January 1953 eclipse were used to determine the vertical ozone distribution in the Earth's atmosphere. A distribution with two maxima at about 8–9 km and 21 km was found for regions near the equator, whereas only one maximum at about 14 km occurred at higher latitudes.

276. SPECTROPHOTOMÉTRIE DE L'ÉCLIPSE DE LUNE DU 29–30 JANVIER 1953 (SPECTROPHOTOMETRY OF THE LUNAR ECLIPSE OF JANUARY 29–30, 1953)
Vigroux, E.
Annales d'astrophysique, v. 17, pp. 399–415, 1954 (*AJ*, 1954, #7332)

A detailed description is presented of the contents of the two current reports in *Comptes rendus hebdomadaires des séances de l'académie des sciences*, v. 239, pp. 227 and 339, 1954.

277. BEOBACHTUNG DER TOTALEN MONDFINSTERNIS VOM 30 JÄNNER 1953 AUF DER UNIVERSITÄTSSTERNWARTE, WIEN (OBSERVATION OF THE TOTAL LUNAR ECLIPSE OF JANUARY 30, 1953 AT THE UNIVERSITY OBSERVATORY, VIENNA)
Hopmann, J.
Anzeiger der österreichischen Akademie der Wissenschaften, mathematisch-naturwissenschaftliche Klasse, v. 90, p. 169, 1953
(See also *Sitzungsberichte der österreichischen Akademie der Wissenschaften, mathematisch-naturwissenschaftliche Klasse, Abteilung IIa*, v. 162, pp. 77–98, 1953)
(*AJ*, 1953)

The eclipse was measured with six different instruments, using four different methods, by a total of ten observers. The times at which the Earth's shadow enters individual lunar craters were thus determined, followed by the brightness curves for the entire Moon and the brightness curves at three selected locations on the Moon's surface. Finally, color values were measured at a number of lunar sites during the eclipse.

278. FOTOMETRIA FOTOGRAFICA DELL'ECLISSE TOTALE DI LUNA DEL 29 GENNAIO 1953 E LA LUMINESCENZA DEL SUOLO LUNARE PER LA RADIAZIONE ULTRAVIOLETTA SOLARE (PHOTOGRAPHIC PHOTOMETRY OF THE TOTAL LUNAR ECLIPSE OF JANUARY 29, 1953 AND THE LUMINESCENCE OF THE LUNAR SURFACE RESULTING FROM ULTRAVIOLET SOLAR RADIATION)
Cimino, M., Fortini, T.
Atti della accademia nazionale dei Lincei, Rendiconti, Classe di scienze fisiche, matematiche e naturali, (8), v. 14, pp. 619–626, 1953
(*AJ*, 1953)

Observations made in Monte Mario are reported.

279. ÉTUDE DE LA LUMIÈRE POLARISÉE DE LA LUNE PENDANT L'ÉCLIPSE TOTALE DE LUNE DU 29–30 JANVIER 1953 À ATHÈNES (STUDY OF THE POLARIZED LIGHT OF THE MOON DURING THE TOTAL LUNAR ECLIPSE OF JANUARY 29–30, 1953 MADE IN ATHENS)
Focas, J. H.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 237, pp. 296–298, 1953
(*AJ*, 1953)

Measurements were made with a Lyot-type visual polarimeter at very small visual angles (between 0 deg 26 min and 1 deg 55 min). The polarization plane was always normal to the visual planes, and the ratio of polarized light varied between −0.4/1000 and −1.5/1000, following the visual angle toward zero. After totality, an unusually large value of −6.6/1000 was found in the Oceanus Procellarum.

280. THE PARTIAL LUNAR ECLIPSE OF AUGUST 5, 1952
Bakharev, A. M.
Astronomicheskii Tsirkuliar, no. 131, pp. 15–18, 1952 (in Russian)
(*AJ*, 1952)

This paper includes discussion of integral brightnesses, crater entrances, visibility, and color estimates.

281. INTEGRAL PHOTOMETRY OF THE LUNAR ECLIPSE OF AUGUST 5, 1952
Yerleksova, G. E., Vassilianovskaya, O. P.
Astronomicheskii Tsirkuliar, no. 131, p. 15, 1952 (in Russian)
(*AJ*, 1952)

282. PHOTOGRAPHIC PHOTOMETRY OF THE PENUMBRA DURING THE LUNAR ECLIPSES OF OCTOBER 26, 1950, FEBRUARY 2, 1952, AND AUGUST 5, 1952
Shchegolev, D. E.
Astronomicheskii Tsirkuliar, no. 131, p. 14, 1952 (in Russian)
(*AJ*, 1952)

283. OBSERVATIONS OF THE LUNAR ECLIPSE OF AUGUST 5, 1952, AT THE ASTRONOMICAL OBSERVATORY, LENINGRAD UNIVERSITY, AKADEMIIA NAUK, LESGAFT INSTITUTE
Sytinskaya, N. N.
Astronomicheskii Tsirkuliar, no. 130, pp. 13–14, 1952 (in Russian)
(*AJ*, 1952)

284. PHOTOMETRIC OBSERVATIONS OF THE LUNAR ECLIPSE OF AUGUST 5–6, 1952
Noskova, R. I., Goikhman, G. Y.
Vsesoiuznoe astronomo-geodezicheskoe obshchestvo, Biulleten, no. 18, pp. 13–16, 1956 (in Russian)
(*AJ*, 1956, #7338)

285. PHOTOELECTRIC PHOTOMETRY OF THE LUNAR ECLIPSE OF SEPTEMBER 26, 1950
Reaves, G., Walker, M. F.
Astronomical Society of the Pacific, Publications of the v. 64, pp. 15–19, 1952
(*AJ*, 1952)

The second half of the total lunar eclipse was observed photoelectrically with a Crossley reflector at the Lick Observatory, using yellow and blue filters. The brightness curves yield amplitudes of 11 mag in the yellow and 12½ mag in the blue. The light of the Earth's shadow was bluer than the original sunlight between 30 and 40 min from the center. This effect was probably caused by the Chappuis bands of ozone in the Earth's atmosphere.

286. THE LUNAR ECLIPSE OF SEPTEMBER 26, 1950
Sharonov, V. V., et al.
Astronomicheskii Tsirkuliar, no. 111, pp. 12–15, 1951 (in Russian)
(*AJ*, 1951)

Observations at the Astronomical Observatory of Leningrad University are described.

287. THE LUNAR ECLIPSE OF SEPTEMBER 26, 1950
Sharonov, V. V.
Priroda, v. 40, no. 10, pp. 46–47, 1951 (in Russian)

288. DIE SILBERKUGEL-PHOTOMETRIE UND IHRE ANWENDUNG AUF DIE MONDFINSTERNIS VOM 2./3. APRIL 1950 (SILVER-SPHERE PHOTOMETRY AND ITS APPLICATION TO THE LUNAR ECLIPSE OF APRIL 2–3, 1950)
Schubert, M.
Die Sterne, v. 27, pp. 40–42, 1951
(*AJ*, 1951)

289. THE LUNAR ECLIPSE OF APRIL 2, 1950
Astapovich, I. S.
Astronomicheskii Tsirkuliar, no. 103–104, pp. 3–8, 1950 (in Russian)
(*AJ*, 1950)

Observations made at Ashkhabad are described, including contacts, crater entrances, stellar occultations, photometry, penumbra, and color.

290. OBSERVATIONS OF THE LUNAR ECLIPSE OF OCTOBER 6–7, 1949, AT THE ASTRONOMICAL OBSERVATORY OF LENINGRAD UNIVERSITY
Sukhov, V., et al.
Astronomicheskii Tsirkuliar, no. 101–102, pp. 11–17, 1950 (in Russian)
(*AJ*, 1950)

This paper includes discussion of crater entrances, brightness of the Moon's disc, illumination of the Earth, integral brightness of the Moon, and photometric observations.

291. OBSERVATIONS PHOTOMÉTRIQUES DANS LE PROCHE INFRA-ROUGE DE L'ÉCLIPSE DE LUNE DU 13 AVRIL 1949 (PHOTOMETRIC OBSERVATIONS IN THE NEAR INFRARED OF THE LUNAR ECLIPSE OF APRIL 13, 1949)
Bloch, M., Falgon, R.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 229, pp. 466–467, 1949
(*AJ*, 1949)

292. OBSERVATIONS PHOTOMÉTRIQUES DE L'ÉCLIPSE DE LUNE DU 13 AVRIL 1949 À L'OBSERVATOIRE DE LYON (PHOTOMETRIC OBSERVATIONS OF THE LUNAR ECLIPSE OF APRIL 13, 1949, AT THE LYON OBSERVATORY)
Bloch, M., Falgon, R.
Journal des observateurs, v. 32, pp. 117–119, 1949
(*AJ*, 1949)

293. OBSERVATIONS OF THE PENUMBRA—LUNAR ECLIPSE OF OCTOBER 18, 1948
Astapovich, I. S., Savrukhin, A.
Astronomicheskii Tsirkuliar, no. 80, pp. 8–9, 1948 (in Russian)
(*AJ*, 1948, #7346)

Observations made in Ashkhabad are described.

294. THE BRIGHTNESS DISTRIBUTION IN THE EARTH'S SHADOW AND PENUMBRA ACCORDING TO ELECTROPHOTOMETRIC OBSERVATIONS OF THE TOTAL ECLIPSE OF DECEMBER 8, 1946
Dzhapiashvili, V. P.
Abastumani, Astrofizicheskaia observatoriia, Biulleten, no. 17, pp. 29–47, 1954
(*AJ*, 1954, #7330)

At the Abastumani Observatory 33-cm mirror telescope, with a gas-filled photocell and using Schott BG 3 and GG 11 filters, 19 measurements were made of the brightness at the center of the Mare Crisium during the eclipse. For purposes of comparison, the celestial background and a radioactive substance were also measured, and the results were presented in the form of curves. Earlier observations and theoretical curves drawn by Fesenkov for various ozone contents of the Earth's atmosphere were used as a reference. These theoretical curves are consistently lower than the observed ones. The actual course ot the brightness is quite irregular and is always steeper in the blue than in the yellow. The western portion of the Earth's shadow is brighter than the eastern portion. This may be attributable to the greater dust and water content of the terrestrial atmosphere in the evenings.

295. ELECTROPHOTOMETRY OF THE TOTAL LUNAR ECLIPSE OF DECEMBER 8, 1946
Dzhapiashvili, V. P.
Astronomicheskii Tsirkuliar, no. 113–114, pp. 15–17, 1951 (in Russian)
(*AJ*, 1951, #7331)

296. LUNAR ECLIPSE OF DECEMBER 8, 1946
Sharonov, V. V.
Astronomicheskii Tsirkuliar, v. 59, pp. 1–2, 1947 (in Russian and English)
(*AJ*, 1948, #7345)

Visual photometric observations are discussed.

297. OBSERVATIONS OF THE LUNAR ECLIPSE OF DECEMBER 8, 1946
Sharonov, V. V.
Leningrad Universitet, Nauchnyi Biulleten, no. 18, pp. 3–4, 1947 (in Russian)
(*AJ*, 1948, #7345)

298. OBSERVATIONS OF THE TOTAL LUNAR ECLIPSE OF DECEMBER 8, 1946
Astapovich, I. S.
Astronomicheskii Tsirkuliar, no. 58, pp. 1–4, 1947 (in Russian)
(*AJ*, 1947, #5407)

This paper includes discussion of contacts, crater entrances and exits, physical observations, determination of the integral brightness (±0.09 mag), and photographic observations (for subsequent photometry).

299. PHOTOMÉTRIE PHOTOÉLECTRIQUE DE L'ÉCLIPSE DE LUNE DU 8 DÉCEMBRE 1946 (PHOTOELECTRIC PHOTOMETRY OF THE LUNAR ECLIPSE OF DECEMBER 8, 1946)
Valniček, B.
Astronomical Institutes of Czechoslovakia, Bulletin of the, v. 1, pp. 9–10, 1947
(*AJ*, 1947, #5407)

300. PHOTOMETRISCHE BEOBACHTUNGEN DER GESAMTHELLIGKEIT DES MONDES WAHREND DER TOTALEN VERFINSTERUNG VOM 8. DEZEMBER 1946 (PHOTOMETRIC OBSERVATIONS OF THE TOTAL BRIGHTNESS OF THE MOON DURING THE TOTAL ECLIPSE OF DECEMBER 8, 1946)
Richter, N.
Astronomische Nachrichten, v. 276, pp. 93–94, 1948
(*AJ*, 1948)

The total brightness of the Moon during the total eclipse of December 8, 1946 is continuously determined with a silver-sphere photometer. With a decrease in the light intensity of 11.7 mag, the totally eclipsed Moon corresponds to a star of −0.85 mag brightness. Empirical observations are reported for the benefit of the profession.

301. TOTAL ECLIPSE OF THE MOON DECEMBER 8, 1946
Bukhar, E.
Astronomical Institutes of Czechoslovakia, Bulletin of the, v. 1, pp. 41–43, 1948
(*AJ*, 1948)

Observations of the lunar eclipse with respect to entrances and exits of lunar objects and brightness determinations of the Moon are discussed.

302. PHOTOMÉTRIE PHOTOGRAPHIQUE DE L'ÉCLIPSE DE LUNE DU 19 DÉCEMBRE 1945 (PHOTOGRAPHIC PHOTOMETRY OF THE LUNAR ECLIPSE OF DECEMBER 19, 1945)
Link, F.
Astronomical Institutes of Czechoslovakia, Bulletin of the, v. 1, pp. 13–16, 1948
(*AJ*, 1948)

Photometric determination of the shadow density at various distances from the center and position angles is discussed.

303. RESULTS OF OBSERVATIONS OF THE LUNAR ECLIPSE OF DECEMBER 19, 1945
Konopleva, V. P., Kolchinski, I. G.
Kiev Universytet, Astronomichna observatoriia, Publikatsii, no. 4, pp. 91–95, 1950 (in Russian)
(*AJ*, 1950, #7346)

Photographic photometry at 6100 and 4400 Å is discussed.

304. PHOTOMETRIC OBSERVATIONS OF THE LUNAR ECLIPSE OF AUGUST 15, 1943
Merkulov, A. V.
Tashkend, Astronomicheskaia observatoriia, Biulletin, v. 2, pp. 494–498, 1948 (in Russian)
(***AJ,*** 1948, #7342)

305. PHOTOMÉTRIE DE L'ÉCLIPSE DE LUNE DU 15 AOÛT 1943 (PHOTOMETRY OF THE LUNAR ECLIPSE OF AUGUST 15, 1943)
Dubois, J.
L'Astronomie, v. 57, pp. 129–130, 1943
(***AJ,*** 1943)

306. ÉCLIPSE PARTIELLE DE LUNE DU 20 FÉVRIER 1943 (PARTIAL ECLIPSE OF THE MOON OF FEBRUARY 20, 1943)
Mandré, F., et al.
L'Astronomie, v. 57, p. 62, 1943
(***AJ,*** 1943, #5436)

307. PHOTOMÉTRIE ET COLORIMÉTRIE DE L'ÉCLIPSE DE LUNE DU 20 FÉVRIER 1943 (PHOTOMETRY AND COLORIMETRY OF THE LUNAR ECLIPSE OF FEBRUARY 20, 1943)
Rougier, G., Dubois, J.
L'Astronomie, v. 57, pp. 65–66, 1943
(***AJ,*** 1943, #5436)

308. PHOTOMÉTRIE DE L'ÉCLIPSE DE LUNE DU 26 AOÛT 1942 (PHOTOMETRY OF THE LUNAR ECLIPSE OF AUGUST 26, 1942)
Rougier, G., Dubois, J.
L'Astronomie, v. 56, pp. 173–174, 1942
(***AJ,*** 1942)

Results are given of observations made at the Bordeaux Observatory.

309. VORLÄUFIGE NOTIZ ÜBER PHOTOMETRISCHE BEOBACHTUNGEN DER GESAMTHELLIGKEIT DES MONDES (PROVISIONAL REPORT ON PHOTOMETRIC OBSERVATIONS OF THE TOTAL BRIGHTNESS OF THE MOON)
Richter, N.
Beobachtungszirkular der astronomischen Nachrichten, v. 24, p. 35, 1942
(***AJ,*** 1942)

310. FARBENPHOTOGRAPHIEN DES VERFINSTERTEN MONDES (COLOR PHOTOGRAPHS OF THE ECLIPSED MOON)
Waldmeier, M.
Die Sterne, v. 22, pp. 77–78, 1942
(***AJ,*** 1942, #5422)

A report is made about the color photographs taken of various phases of the lunar eclipse of March 2–3, 1942 at the two observatories on the Chuggen (2050 m) at Arosa. The exposure times for the apparatus used are given.

311. GESAMTHELLIGKEITEN DES MONDES WÄHREND DER FINSTERNIS UND WÄHREND ANDERER FINSTERNISSE (TOTAL BRIGHTNESS OF THE MOON DURING THE ECLIPSE AND DURING OTHER ECLIPSES)
Loreta, E.
Beobachtungszirkular der astronomischen Nachrichten, v. 24, p. 35, 1942
(***AJ,*** 1942, #5405)

Light curves for the total brightness of the Moon and the ash-gray moonlight are discussed for the eclipse of March 2–3, 1942.

312. ÉTUDE PHOTOMÉTRIQUE ET COLORIMÉTRIQUE DE L'ÉCLIPSE TOTALE DE LUNE DES 2 ET 3 MARS 1942 (PHOTOMETRIC AND COLORIMETRIC STUDIES OF THE TOTAL LUNAR ECLIPSE OF MARCH 2–3, 1942)
Rougier, G., Dubois, J.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 214, pp. 700–702, 1942
(***AJ,*** 1942)

313. OBSERVATIONS PHOTOMÉTRIQUES EFFECTUÉES À L'OBSERVATOIRE DE BORDEAUX, DE L'ÉCLIPSE DE LUNE DES 2 ET 3 MARS 1942 (PHOTOMETRIC OBSERVATIONS MADE AT THE BORDEAUX OBSERVATORY OF THE ECLIPSE OF THE MOON ON MARCH 2–3, 1942)
Rougier, G., Dubois, J.
Ciel et terre, v. 58, pp. 209–211, 1942
(***AJ,*** 1942)

314. PHOTOMETRISCHE BEOBACHTUNGEN DER GESAMTHELLIGKEIT DES MONDES IM VERLAUFE DER TOTALEN VERFINSTERUNG VOM 2. ZUM 3. MÄRZ 1942 (PHOTOMETRIC OBSERVATIONS OF THE TOTAL BRIGHTNESS OF THE MOON IN THE COURSE OF THE TOTAL ECLIPSE OF MARCH 2–3, 1942)
Richter, N.
Zeitschrift für Astrophysik, v. 21, pp. 249–253, 1942
(*AJ*, 1942)

A simple and practical method is suggested for the photometric extension of the total brightness of the Moon to stars in the course of eclipses. The brightness amplitude during the eclipse of March 2–3, 1942, is determined to be 12.5 mag. The decrease in brightness after total eclipse has occurred is still 2.5 mag. The influence of the penumbra does not exceed 0.5 mag. The accuracy attained is very satisfactory. Proposals are presented for the improvement of instruments.

315. ÉTUDE PHOTOMÉTRIQUE DE L'ÉCLIPSE TOTALE DE LUNE DE LA NUIT DU 2 AU 3 MARS 1942 (PHOTOMETRIC STUDY OF THE TOTAL LUNAR ECLIPSE ON THE NIGHT OF MARCH 2–3, 1942)
Barbier, D., Chalonge, D., Vigroux, E.
Annales d'astrophysique, v. 5, pp. 58–70, 1942
(*AJ*, 1942)

Spectrophotometric investigations of photographs made before and during the eclipse are described. The significance of the spectrophotometric observations of lunar eclipses in the investigation of the upper atmospheric layers of the Earth is pointed out.

316. PHOTOMÉTRIE DE L'ÉCLIPSE DE LUNE DU 2–3 MARS 1942 (PHOTOMETRY OF THE LUNAR ECLIPSE OF MARCH 2–3, 1942)
Rougier, G., Dubois, J.
L'Astronomie, v. 56, pp. 81–82, 1942
(*AJ*, 1942)

Photometry of the eclipse with a cat's-eye photometer in the red, green, and blue is described.

317. PHOTOMETRY OF A LUNAR ECLIPSE
Guman, I.
Csillagászati Lapok, v. 4, pp. 37–39, 1941
(in Hungarian)
(*AJ*, 1941, #5421)

The investigations of the eclipse of November 7–8, 1939, made by Link and V. Guth (*Zeitschrift für Astrophysik*, v. 18, p. 207, 1939) are discussed.

318. INTEGRAL BRIGHTNESSES OF THE MOON AT THE TIME OF THE ECLIPSE OF MAY 3, 1939
Chernov, V. M.
Tadzikskaia astronomicheskaia observatoriia, Tsirkuliar, v. 43, p. 4, 1940 (in Russian)
(*AJ*, 1940)

319. ON THE INTEGRAL BRIGHTNESS OF THE LUNAR ECLIPSE OF MAY 3, 1939
Merkulov, A. V.
Tashkend, astronomicheskaia observatoriia, Biulleten, v. 2, pp. 137–140, 1940 (in Russian with English abstract)
(*AJ*, 1940)

320. L'ÉCLIPSE TOTALE DE LUNE DU 3 MAI 1939 (THE TOTAL ECLIPSE OF THE MOON OF MAY 3, 1939)
Chernov, V. M.
Gazette astronomique, v. 27, pp. 18–19, 1940
(*AJ*, 1940)

Observation of the eclipse in Tadyikstan is described.

321. COMMENTS ON THE PAPER BY N. BARABASHOV: BRIGHTNESS DISTRIBUTION IN THE EARTH'S SHADOW AT THE TIME OF THE TOTAL ECLIPSE OF NOVEMBER 7–8, 1938
Merkulov, A. V.
Russkii astronomischeskii zhurnal, v. 17, no. 4, pp. 74–75, 1940 (in Russian)
(*AJ*, 1940)

322. DISTRIBUTION OF BRIGHTNESS IN THE EARTH SHADOW DURING THE TOTAL ECLIPSE OF THE MOON ON NOVEMBER 7–8, 1938
Barabashov, N. P.
Russkii astronomicheskii zhurnal, v. 16, no. 5, pp. 36–40, 1939 (in Russian with English abstract)
(*AJ*, 1939)

Photographic observations of the lunar eclipse made at the Kharkov Observatory are described. The brightness distribution in the Earth's shadow during the lunar eclipse is derived in red and green light and compared with the theoretical distribution. The brightness of the Moon, at a distance of 0.0 to 0.2 of the shadow radius from the center, is somewhat greater in green light than in violet. However, at a distance of 0.5 the relationship is reversed. This phenomenon can be partially explained by the influence of the atmospheric ozone.

323. FOTOMETRIA FOTOGRAFICA DELL'ECLISSE TOTALE DI LUNA DEL 7–8 NOVEMBRE 1938 NELLE ZONE SPETTRALI ATTORNO A 4700, 5600 E 7050 Å (PHOTOGRAPHIC PHOTOMETRY OF THE TOTAL LUNAR ECLIPSE OF NOVEMBER 7–8, 1938 IN THE SPECTRAL REGIONS OF 4700, 5600 AND 7050 Å)
Cecchini, G.
Memorie della società astronomica italiana, nuova serie, v. 13, pp. 193–223, 1940
(*AJ*, 1940)

Results of the photographic observations of the lunar eclipse with the 20-cm Zeiss refractor are presented and discussed. The light variations in the penumbra as a function of the distance from the center of the shadow are found to be symmetrical in the corresponding increase and decrease phases. The optical density of the shadow depends not only on wavelength but also on the shadow radius and changes with time along the radius at least up to 30 min from the center. The shadow density at the center, relative to the uneclipsed Moon, is 15 mag, 13 mag, and 9 mag for the three wavelengths. These results are discussed on the basis of Link's photometric theory.

324. PHOTOMETRISCHE ANALYSE DER MONDFINSTERNIS VOM 7.–8. NOVEMBER 1938 (PHOTOMETRIC ANALYSIS OF THE LUNAR ECLIPSE OF NOVEMBER 7–8, 1938)
Link, F., Guth, V.
Zeitschrift für Astrophysik, v. 20, pp. 1–12, 1940
(*AJ*, 1940)

325. PHOTOMETRISCHE BEOBACHTUNG DER MONDFINSTERNIS VOM 7.–8. NOVEMBER 1938 (PHOTOMETRIC OBSERVATIONS OF THE LUNAR ECLIPSE OF NOVEMBER 7–8, 1938)
Widorn, T. R.
Astronomische Nachrichten, v. 268, pp. 225–228, 1939
(*AJ*, 1939)

326. FOTOMETRIA DELL'ECLISSE TOTALE DI LUNA DEL 7–8 NOVEMBRE 1938 (PHOTOMETRY OF THE TOTAL LUNAR ECLIPSE OF NOVEMBER 7–8, 1938)
Colacevich, A.
Memorie della società astronomica italiana, nuova serie, v. 12, pp. 289–301, 1939
(*AJ*, 1939)

The results of photometric measurements of 26 photographs of the lunar eclipse at three different wavelengths are presented and discussed.

327. DIE HELLIGKEITSVERTEILUNG IM ERDSCHATTEN BEI DER TOTALEN MONDFINSTERNIS VOM 7 NOVEMBER 1938 (THE BRIGHTNESS DISTRIBUTION IN THE EARTH'S SHADOW DURING THE TOTAL LUNAR ECLIPSE OF NOVEMBER 7, 1938)
Link, F., Guth, V.
Zeitschrift für Astrophysik, v. 18, pp. 207–211, 1939
(*AJ*, 1939)

The brightness distribution in the Earth's shadow is derived from photographic photometric measurements (for $\lambda = 0.58\ \mu$) of the lunar eclipse of November 7, 1938. The new method was first used in 1936. The measurements reveal strong flattening of the isophotes and a change in density with time for one and the same shadow area.

328. THE BRIGHTNESS OF THE MOON AT THE TIME OF TOTAL LUNAR ECLIPSE NOVEMBER 7, 1938
Chernov, V. M.
Tadzikskaia astronomicheskaia observatoriia, Tsirkuliar, v. 42, pp. 3–4, 1939 (in Russian)
(*AJ*, 1939)

With the use of an inverted telescope, the Moon is compared with stars which are visible to the naked eye.

329. THE BRIGHTNESS OF THE TOTALLY ECLIPSED MOON, NOVEMBER 7, 1938
Young, J.
British Astronomical Association, Journal of the, v. 49, pp. 247–254, 1939
(*AJ*, 1939)

330. DIE HELLIGKEITSVERTEILUNG IM ERDSCHATTEN BEI DER TOTALEN MONDFINSTERNIS 1936 JANUAR 8 (THE BRIGHTNESS DISTRIBUTION IN THE EARTH'S SHADOW DURING THE TOTAL LUNAR ECLIPSE OF JANUARY 8, 1936)
Siedentopf, H., Raudenbusch, H.
Astronomische Nachrichten, v. 259, pp. 317–322, 1936
(*AJ*, 1936, #5423)

Various possible means for determining brightness are discussed in the introduction. Using the photographic photometric method, the authors were able to take five photographs of 20-sec exposure each. The result is compared with those obtained during other eclipses.

331. THE BRIGHTNESS OF THE ECLIPSED MOON
Witkowski, J.
British Astronomical Association, Journal of the, v. 46, pp. 391–392, 1936
(*AJ*, 1936, #5420)

332. PHOTOMÉTRIE PHOTOGRAPHIQUE DES ÉCLIPSES DE LUNE (PHOTOGRAPHIC PHOTOMETRY OF LUNAR ECLIPSES)
Link, F., Guth, V.
Journal des observateurs, v. 19, pp. 129–132, 1936
(*AJ*, 1936, #5423)

The method and its application to the lunar eclipse of January 8, 1936, are described.

333. FOTOMETRIA DELL' ECLISSE TOTALE DI LUNA DELL' 8 GENNAIO 1936 (PHOTOMETRY OF THE TOTAL ECLIPSE OF THE MOON OF JANUARY 8, 1936)
Colacevich, A.
Memorie della società astronomica italiana, v. 9, pp. 289–303, 1936
(*AJ*, 1936)

Various photographs were obtained during and after the eclipse with the 30-cm reflector on Agfa-superpan and Cappeli-blue plates. No irregularity was noted in the reflection at 37 points in the lunar seas. The results were compared with those obtained by N. Barabashov and B. Semeykin.

334. PHOTOMETRISCHE BEOBACHTUNGEN DER MONDFINSTERNIS AM 2. APRIL 1931 DURCH DAS ROTE UND BLAUE FARBFILTER (PHOTOMETRIC OBSERVATIONS OF THE LUNAR ECLIPSE ON 2 APRIL 1931 THROUGH RED AND BLUE COLOR FILTERS)
Barabashov, N. P. and Semeykin, B. E.
Zeitschrift für Astrophysik, v. 6, pp. 114–120, 1933
(*AJ*, 1933, #5417)

The brightness variation in the umbra and penumbra is investigated. The red radiation remains in the umbra, even when its center is approached; the blue does not. The magnitude of the brightness variation for red and blue rays is given.

335. NOTE ON THE EFFECT OF PHASE ANGLE ON LUNAR ECLIPSE PHOTOMETRY
Keenan, P. C.
Astronomical Society of the Pacific, Publications of the, v. 42, pp. 58–60, 1930
(*AJ*, 1930, #5414)

The eclipse of November 27, 1928, and the comparative measurements made on the following evening are discussed. According to W. H. Wright, the phase angle must have been taken into consideration in these measurements. The author, however, feels that this would hardly have been correct in this case.

336. THE PHOTOMETRY OF THE TOTAL LUNAR ECLIPSE OF NOVEMBER 27, 1928
Keenan, P. C.
Astronomical Society of the Pacific, Publications of the, v. 23, pp. 297–304, 1929
(***AJ***, 1929, #5416)

An investigation is made of the brightness ratios for a point between the middle and edge of the shadow, using photographs with and without color filters. The brightness decreases to about 1/10,000 of normal value; at this value, the type of decrease in brightness varies for different spectral regions.

337. LUNAR ECLIPSE, DECEMBER 8, 1927
Semeykin, B. E.
Kharkov Universitet, Astronomicheskaia observatoriia, Publikatsii, v. 3, pp. 53–62, 1931
(in Ukrainian and German)
(***AJ***, 1931, #5412)

Photometric investigation is made of the penumbra and umbra limits using photographic exposures.

338. LUNAR ECLIPSE, AUGUST 14, 1924
Yevdokimov, N., Barabashov, N. P., et al.
Astronomische Nachrichten, v. 224, pp. 159–164, 1925
(***AJ***, 1924, #5407)

Star occultation, contact, and photometric observations are discussed.

339. THE PHOTOMETRIC STUDY OF THE TOTAL ECLIPSE OF THE MOON ON AUGUST 14, 1924
Dufay, J., Couder, A.
Comptes rendus hebdomadaires des séances de l'académie des sciences, January 19, 1925
(***AJ***, 1925, #5408)

The Moon is compared photometrically with Mars and Jupiter. The increase in the color index toward the center of the shadow indicates a strong increase in the red coloration. This coloration was found to be about four times brighter than it was in the 1921 eclipse.

MOON

Books

340. THE MOON
Sharonov, V. V.
Natural Science Library of Journal and Book Publishers, USSR, 1947 (in Russian)

341. THE MOON AND ITS OBSERVATION
Sytinskaya, N. N.
State Publisher for Technical Literature, Moscow, 1956 (in Russian)

Reports

342. WHAT DO LUNAR TEMPERATURES TELL US CONCERNING THE NATURE OF THE MOON'S SURFACE?
Heinz, L.
December 1955
Air Force Cambridge Research Center, Bedford, Mass.
Report
AD-78, 211

The use of the temperature radiation of the Moon to compute the temperature of the Moon's surface, and thus to obtain information on the physical nature of the surface, is described.

343. POLARIZATION OF LIGHT FROM THE MOON, MARS, VENUS, AND NGC 7023
Gehrels, T.
Paper presented at the 103rd AAS Meeting, Toronto, Canada, August 30–September 2, 1959
American Astronomical Society, Inc., New York, N.Y.
(Abstracted in *Astronomical Journal*, v. 64, p. 332, October 1959)

344. ANNOTATED BIBLIOGRAPHY OF THE PHYSICAL OBSERVATIONS OF THE MOON—1920 TO 1960
Pogo, A., Helin, E., Murray, B., Roux, N., Upton, B., Watson, K.
September 1961
California Institute of Technology, Lunar Research Lab., Pasadena
Report

345. PROBLÈMES SOULEVÉS PAR LA PHOTOMÉTRIE DES ÉCLIPSES DE LUNE (PROBLEMS RAISED BY THE PHOTOMETRY OF THE LUNAR ECLIPSES)
Link, F.
1948
Commission for the Study of the Relations Between Solar and Terrestrial Phenomena, France
Report 6, pp. 174–175
(*AJ*, 1948, #7331)

During several eclipses, the isophotes of the Moon's shadow were flattened in a north-southerly direction. The explanation for this is found in the geographical-latitude-dependent distribution of the ozone. On December 18, 1945, the penumbra also manifested flattened isophotes. At the edge of the shadow, the penumbra was several times brighter than expected. The author presumes that the Moon becomes luminescent under the influence of solar radiation.

346. PHOTOGRAPHIC PHOTOMETRY OF THE LUNAR SURFACE
Fedorets, V. A.
1951
Kharkov, University of, USSR
Thesis (in Russian)
(*AJ*, 1951, #7306)

347. THE PROBABLE NATURE OF THE LUNAR SURFACE FROM PHOTOMETRIC AND COLORIMETRIC DATA
Sytinskaya, N. N., Sharonov, V. V.
1951–1952
Leningrad University, USSR
Scientific Session, pp. 11–13 (in Russian)
(*AJ*, 1952, #7322)

348. INFRARED RADIANT INTENSITIES OF THE SUN AND OF THE MOON IN THE 2- TO 6-MICRON REGION (MEASURED BY AN AIRBORNE RADIOMETER)
Augason, G. C.
Naval Ordnance Test Station, China Lake, Calif.
NOTS-TP-2443, NAVWEPS-R-7051

In the design and use of infrared-sensing devices, it is often necessary to consider the effects of direct and re-

flected sunlight on the studies to be made with that equipment. This report presents measurements in graphic form of radiation from the Sun and from the Moon. The measurements were recorded by an airborne radiometer, sensitive in the 2- to 6-μ region of the spectrum. A method is given for using these data to determine the effects of the radiation, and a suggestion is made as to the possible use of such information.

Periodicals

349. COLORIMETRIC MEASUREMENTS OF LUNAR FEATURES
Wegner, G.
Astronomical Society of the Pacific, Publications of the, v. 72, no. 426, pp. 364–365, October 1960
(Abstract)

Colorimetric measurements of lunar features have been compared with similar data for some 110 terrestrial minerals in an attempt to determine the composition of the lunar surface.

350. SPECTROPOLARIMETRY OF SOME REGIONS OF THE LUNAR SURFACE
Teifel', V. G.
Astronomicheskii Zhurnal, v. 37, no. 4, pp. 703–708, July–August 1960
Translated from the Russian in ***Soviet Astronomy—AJ***, v. 4, no. 4, pp. 669–673, January–February 1961

351. PHOTOMETRIC PECULIARITIES OF THE MOON
Fesenkov, V. G.
Astronomicheskii Zhurnal, v. 37, no. 3, pp. 496–500, May–June 1960
Translated from the Russian in ***Soviet Astronomy—AJ***, v. 4, no. 3, pp. 468–472, November–December 1960

352. PHOTOMETRY OF THE MOON
Struve, O.
Sky and Telescope, v. 20, no. 2, pp. 70–73, August 1960

Various methods of measuring the brightness of the lunar surface and the floors of lunar craters are discussed, and results of photometric analyses are presented.

353. ON NORMAL COLOR INDEXES AND THE COLOR-BRIGHTNESS RELATION FOR PORTIONS OF THE LUNAR SURFACE
Teifel', V. G.
Soviet Astronomy—AJ, v. 3, pp. 115–121, 1960
(in English)

On the basis of catalog data [*Akademiia nauk Kazakhskoi SSSR, Trudy, sektor astrobotaniki*, v. 8] the upper limit of color contrasts on the lunar surface in a system of normal color indexes may be judged.

354. THE DIFFERENCE IN THE SPECTRAL PROPERTIES OF AREAS ON THE LUNAR SURFACE
Teifel', V. G.
Astronomicheskii Zhurnal, v. 36, no. 6, pp. 1041–1046, November–December 1959
Translated from the Russian in ***Soviet Astronomy—AJ***, v. 3, no. 6, pp. 955–959, May–June 1960

The results of spectrophotometric measurements of 90 lunar areas in the range 390–620 mμ are considered. The spectral curves for these areas, constructed relative to a reference area in Mare Vaporum, are characterized by an almost monotonic variation of intensity along the spectrum. This allows the color indexes to be used for the determination of the color of lunar objects. The maximum difference in the spectral curves, expressed in relative spectrophotometric gradients, is 0.57 for 390–500 mμ and 0.72 for 510–620 mμ; that is, it does not exceed 0.6 of the spectral class dG. (*PA*, 1960, #18,694)

355. A STUDY OF THE ROCKS MOST CLOSELY RESEMBLING THE SURFACE CONSTITUENTS OF THE MOON
Barabashov, N. P., Chekirda, A. T.
Astronomicheskii Zhurnal, v. 36, no. 5, pp. 851–875, 1959
Translated from the Russian in ***Soviet Astronomy—AJ***, v. 3, no. 5, pp. 827–831, March–April 1960

On the basis of observations, it was found that the lunar surface does not resemble a fused surface, but most probably is covered with disrupted tuffaceous rock and, in some places, by coarse-grained volcanic ash. (*PA*, 1060, #18,696)

356. COLOR CONTRASTS OF THE LUNAR SURFACE
Barabashov, N. P., et al.
Astronomicheskii Zhurnal, v. 36, no. 3, pp. 496–502, 1959
Translated from the Russian in *Soviet Astronomy—AJ*, v. 3, no. 3, pp. 484–489, December 1959

357. CONTRIBUTION TO THE STUDY OF THE LUNAR LIGHT
Dubois, J.
Rozpravy Ceskoslovenské akademie věd, Řada technickych věd, v. 69, pp. 1–44, 1959
(Abstracted in *Bulletin signalétique*, v. 20, no. 11–12, p. 5264, 1959)

358. DENSITÉ DE LA PÉNOMBRE PENDANT LES ÉCLIPSES DE LUNE (DENSITY OF THE PENUMBRA DURING LUNAR ECLIPSES)
Link, F.
Astronomical Institutes of Czechoslovakia, Bulletin of the, v. 9, pp. 169–178, 1958
(*AJ*, 1958, #7358)

The theoretical brightness distribution in the penumbra is determined theoretically, using the most recent data on the structure of the Earth's atmosphere, and the results are compared with the observations. Approximately 75% of the eclipses yield excessive brightnesses, which are explained by the possibility of a luminescence of the lunar surface caused by solar ultraviolet radiation. Furthermore, the brightness of the penumbra appears to be related to the position of the corresponding crepuscular zone on Earth and indicates a greater transmissivity of the terrestrial atmosphere in the polar regions.

359. THE COLOR EXCESS OF SIX LUNAR CRATERS FROM ELECTROPHOTOMETRIC OBSERVATIONS
Koslova, K. I., Glagolevski, Y. V.
Astronomicheskii Tsirkuliar, no. 198, pp. 1–2, 1958 (in Russian)
(*AJ*, 1958, #7387)

360. THE SPECTRAL DIFFERENCES OF PARTS OF THE LUNAR SURFACE
Teifel', V. G.
Astronomicheskii Tsirkuliar, no. 196, pp. 5–6, 1958 (in Russian)
(*AJ*, 1958, #7343)

From relative spectrophotometry between λ 3900 and 6200 Å of 90 regions on the lunar surface with reference to the Mare Vaporum, the spectrophotometric difference is found to amount to a maximum of 0.6 spectral classes dG.

361. THE ABSOLUTE BRIGHTNESS VALUES OF THE LUNAR EDGE AT VARIOUS PHASES
Orlova, N. S.
Astronomicheskii Tsirkuliar, no. 192, pp. 20–21, 1958 (in Russian)
(*AJ*, 1958, #7333)

Since it has been ascertained by various sources that the Moon's edge is suitable for correlation with surface brightness measurements of other objects, especially illuminated night clouds, the course of the brightness of the bright equatorial lunar edge is tabulated for the phase angles $0 \leq \alpha \leq 140$ deg.

362. THE THRESHOLD OF COLOUR DISTINCTION DURING VISUAL OBSERVATIONS OF THE LUNAR SURFACE AND THE MAXIMAL COLOUR DIFFERENCE OF LUNAR OBJECTS
Radlova, L. N., Sharonov, V. V.
Astronomicheskii Zhurnal, v. 35, pp. 788–791, 1958
Translated from the Russian in *Soviet Astronomy—AJ*, v. 2, pp. 735–738, 1958
(*AJ*, 1958, #7337)

363. THE POLARIZATION OF LIGHT REFLECTED BY THE LUNAR SURFACE
Turner, G.
British Astronomical Association, Journal of the, v. 68, pp. 253–263, 1958
(*AJ*, 1958, #7346)

This paper summarizes the contributions made by a number of observers since about 1920. In the second section, comparisons are made with terrestrial materials, and opinions on conditions on the lunar surface are discussed.

364. LA TEINTE ANORMALE DE LA LUNE (THE ABNORMAL COLOR OF THE MOON)
Chernov, V. M.
Gazette astronomique, v. 40, pp. 26–27, 1958
(*AJ*, 1958, #7345)

365. THE RESULTS OF MEASUREMENTS OF THE POLARIZATION OF DETAILS ON THE LUNAR SURFACE
Markov, A. V.
Pulkovo, Astronomicheskaia observatoriia, Izvestiia, no. 5 (158), pp. 135–155, 1958 (in Russian with English abstract)
(*AJ*, 1958, #7328)

The light polarization of 40 structurally different objects on the lunar surface was ascertained between the phase angles of −38 and +80 deg, using a Sliussarev camera equipped with an electropolarimeter. The measurements of the radiation systems, craters, and large seas yielded an increase in the polarization at the time of quadrature, whereas the albedo diminished. The crater seas (Schickard, Grimaldi, etc.) polarized the light less, presumably because of their structure.

366. ON THE NATURE AND COLOR OF THE MOON'S SURFACE
Platt, J. R.
Science, v. 127, pp. 1502–1503, 1958
(*AJ*, 1958, #7334)

The possibility is discussed that the lunar surface may be so damaged by high-energy radiation that it is chemically unstable. This could explain the high absorptive capacity in the visible as well as the low thermal conductivity, without recourse to the assumption of the existence of layers of cosmic dust which itself might be chemically activated.

367. COLOR ON THE MOON
Firsoff, V. A.
Sky and Telescope, v. 17, pp. 328–331, 1958
(*AJ*, 1958, #7316)

This paper reports the author's visual color observations of the lunar surface made with color filters between 1953 and 1956. The results are compared with those obtained by other observers.

368. LUNAR COLONGITUDE: WHY, WHAT, HOW, AND WHEN
Haas, W. H.
Strolling Astronomer, v. 12, pp. 80–82, 1958
(*AJ*, 1958, #7322)

369. THE STRUCTURE OF THE EARTH'S SHADOW
Chernov, V. M., Chistiakov, V. F.
Vsesoiuznoe astronomo-geodezicheskoe obshchestvo, Biulleten, no. 22, pp. 12–22, 1958 (in Russian)
(*AJ*, 1958, #7361)

370. INVESTIGATION OF THE POLARIZATION PROPERTIES OF CONFIGURATIONS ON THE LUNAR SURFACE BY MEANS OF ELECTROPHOTOMETRIC MEASUREMENTS
Dzhapiashvili, V. P.
Abastumani, Astrofizicheskaia observatoriia, Biulleten, no. 21, p. 168, 1957 (in Russian with English abstract)
(*AJ*, 1957, #7356)

In this paper, the problems and methods of investigating the lunar surface are discussed, with special emphasis on polarimetry. The equipment employed and methods of observation are described, and the results are presented in tables and graphs. After a discussion of the results, suggestions for additional observations are made.

371. A NEW VALUE OF THE LIGHT CONSTANT OF THE MOON
Sytinskaya, N. N.
Astronomicheskii Zhurnal, v. 34, pp. 899–902, 1957 (in Russian)
(*AJ*, 1957, #7326)

372. THE COLOR CONTRASTS ON THE LUNAR SURFACE IN THE VISUAL SPECTRAL REGION
Teifel', V. G.
Astronomicheskii Tsirkuliar, no. 179, pp. 8–10, 1957 (in Russian)
(*AJ*, 1957, #7381)

The photographic spectrophotometric measurements of the surface formations of the Moon, made by the author in the fall of 1956, were used to determine color contrasts. Only in a few cases did the contrasts reach 18–20%.

373. THE MAGNITUDE OF THE COLOR CONTRASTS ON THE LUNAR SURFACE
Radlova, L. N.
Astronomicheskii Tsirkuliar, no. 179, pp. 7–8, 1957 (in Russian)
(*AJ*, 1957, #7377)

Six lists and catalogs with data on the colors of lunar formations were compared with each other in pairs and investigated for systematic errors in the color indexes. Since no significant errors were found, the color contrasts of formations are also considered to be free of inhomogeneities. This was confirmed by additional standard measurements made in Tashkend.

374. NINETEENTH-CENTURY STUDIES OF THE POLARIZATION OF LIGHT REFLECTED BY THE MOON
Turner, G.
British Astronomical Association, Journal of the, v. 67, pp. 185–188, 1957
(*AJ*, 1957, #7328)

The first reference to the polarization of moonlight was made by Arago in 1811. This and later works by Secchi, Parsons, Landerer, Salet, and Barabashov are discussed. Details and critical comments are included.

375. THE COLOUR OF MOONLIGHT AND THE COMPOSITION OF THE MOON'S SURFACE
Fielder, G.
International Lunar Society, Journal of the, v. 1, pp. 25–31, 1957
(*AJ*, 1957, #7360)

A summary of previous work on the color of moonlight and the composition of the lunar surface is presented.

376. ON THE LUMINESCENSE OF THE LUNAR GROUND FOR THE ULTRAVIOLET SOLAR RADIATION DURING LUNAR ECLIPSES
Cimino, M.
International Lunar Society, Journal of the, v. 1, pp. 9–11, 19, 1957
(*AJ*, 1957, #7333)

On the basis of observations made during three lunar eclipses, the author was able to ascertain an increase in the brightness of the lunar surface in the penumbra. This excess of light intensity, compared with the theoretical value, appears to change from eclipse to eclipse, as well as from zone to zone of the lunar surface. The author considers the assumption valid that the cause of this phenomenon is to be found in a luminescence effect which is originated by the ultraviolet and corpuscular radiation of the Sun.

377. SUR L'EXISTENCE DE LA LUMINESCENCE LUNAIRE. RÉSULTATS OBTENUS (ON THE EXISTENCE OF LUNAR LUMINESCENCE. RESULTS OBTAINED)
Dubois, J.
Journal de physique et le radium, v. 18, pp. 13–15, 1957
(*AJ*, 1957, #7305)

378. THE ORIGIN AND NATURE OF THE OUTER LAYER OF THE LUNAR SURFACE ACCORDING TO DATA FROM COMPARATIVE STUDIES OF CHROMATICITY DIAGRAMS
Sytinskaya, N. N.
Leningrad Universitet, Uchenye Zapiski, no. 190, Math. no. 29, pp. 74–87, 1957 (in Russian);
Astronomicheskaia observatoriia, Trudy, v. 17, pp. 74–87, 1957
(*AJ*, 1957, #7380)

Ninety-one objects on the Moon's surface were plotted in a chromaticity diagram. The same diagram was drawn for various sedimentary and magnetic rocks, as well as for meteorites. It was found that the various rocks generally occupy a much larger area of the chromaticity diagram, although they do not extend into the area of the Moon objects in this diagram. It is concluded from this that no primary, exposed rocks will be found on the lunar surface but rather, that the lunar surface is a product of later development. Meteors appear to play the largest role in this development.

379. COMPARISON OF THE LAW OF REFLECTION OF LIGHT FOR THE MOON AND FOR CERTAIN KINDS OF ROCKS
Orlova, N. S.
Leningrad Universitet, Vestnik, no. 1, pp. 152–157, 1957 (in Russian)
(*AJ*, 1957, #7376)

380. FRÜHE BEOBACHTUNG DER MONDSICHEL NACH NEUMOND (EARLY OBSERVATIONS ON THE MENISCUS AFTER THE NEW MOON)
Ahnert, P.
Die Sterne, v. 33, pp. 233–235, 1957
(*AJ*, 1957, #7302)

The conditions for the very early observation of the young meniscus are discussed. The light of the new Moon of March 2, 1957, is described and compared with older observations.

381. LUMINESCENCE OF THE LUNAR SURFACE AND INTENSITY OF THE SOLAR CORPUSCULAR RADIATION
Kozyrev, N. A.
Akademiia nauk SSSR, Krymskaia astrofizicheskaia observatoriia, Izvestiia, v. 16, pp. 148–158, 1956 (in Russian with French abstract)
(*AJ*, 1956, #7315)

From a comparison of the outlines of strong Frauenhofer lines in the solar and lunar spectra, the luminescence for the Aristarchus-Herodotus system was confirmed. This luminescence was found to be a property of the white matter of the radiation systems. Other details of the lunar surface do not manifest this phenomenon. The particularly strong luminescence of October 4, 1955, can be traced to the effect of solar corpuscular radiation, whose density was approximately $5 \times 10^3/cm^3$. The Moon does not possess a magnetic field.

382. RECHERCHES D'UNE ATMOSPHÈRE AUTOUR DE LA LUNE (INVESTIGATIONS CONCERNING THE EXISTENCE OF A LUNAR ATMOSPHERE)
Dollfus, A.
Annales d'astrophysique, v. 19, pp. 71–82, 1956
(*AJ*, 1956, #7311)

A lunar atmosphere would have to be relatively bright at a 90-deg phase angle near the tips of the crescent. Using a coronagraph, no such effect could be found with either the usual photometry or polarimetry.

383. THE RELATIONSHIP BETWEEN THE POLARIZATION AND THE ALBEDO OF OBJECTS ON THE LUNAR SURFACE
Sytinskaya, N. N.
Astronomicheskii Tsirkuliar, no. 168, p. 18, 1956 (in Russian)
(*AJ*, 1956, #7326)

The maximum degree of polarization P at a phase angle of ± 90 deg (per Lyot) and the visual albedo ρ at full Moon (per Sytinskaya) were compared for 11 objects on the lunar surface. The following linear approximation was derived: $P = 0.276 - 1.95\,\rho$.

384. ELECTROPOLARIMETRY OF THE LUNAR SURFACE
Dzhapiashvili, V. P.
Astronomicheskii Tsirkuliar, no. 167, pp. 16–19, 1956 (in Russian)
(*AJ*, 1956, #7358)

In the years 1950–1953, the polarization of 41 lunar objects was measured with the 33-cm refractor at the Abastumani Observatory. The degree of polarization is clearly dependent upon the phase angle; its maximum is reached at the instant of quadrature. In half of the objects, however, the maximum value occurs at a phase angle which deviates by a few degrees. The minimum polarization occurs at full Moon. Average polarization values for typical lunar formations are given.

385. COLOR DIFFERENCES ON THE LUNAR SURFACE
Sharonov, V. V.
Astronomicheskii Tsirkuliar, no. 166, pp. 9–11, 1956 (in Russian)
(*AJ*, 1956, #7376)

Visual observations made between 1953 and 1955, using various instruments with diameters from 13 to 20 cm, yielded no evidence of color contrasts on the lunar surface. It is proposed that the color contrasts detected by N. P. Barabashov and his colleagues were the result of faulty photographic photometry.

386. PHOTOMETRIC RELIEF OF THE LUNAR SURFACE
Orlova, N. S.
Astronomicheskii Zhurnal, v. 33, no. 1, pp. 93–100, 1956 (in Russian)

Respective measurements of the brightness of the lunar surface and the absolute measurements of brightness were reduced. Assuming the surface of the continents and the surface of the seas to be similar in all points of the lunar disc, average coefficients of brightness were derived for various combinations of the angles of incidence and reflection. Results related only with the plane of incidence of the solar rays for seas and for the continents are given. It is shown that the surface of the Moon is covered with extremely porous matter.

387. LUNAR VARIATIONS IN THE IONOSPHERE
Duncan, R. A.
Australian Journal of Physics, v. 9, no. 1, pp. 112–132, March 1956

388. COMPARAISON SPECTROPHOTOMÉTRIQUE DE LA LUMIÈRE DIFFUSEE PAR QUELQUES POINTS DE LA LUNE (SPECTROPHOTOMETRIC COMPARISON OF THE DIFFUSED LIGHT AT SEVERAL POINTS ON THE MOON)
Vigroux, E.
Journal des observateurs, v. 39, pp. 134–136, 1956
(*AJ*, 1956, #7381)

Spectrophotometric data are given for eight different points on the lunar surface. The spectral intensity distribution is essentially the same in all cases.

389. COMPARISON OF THE COLOR AND THE BRIGHTNESS COEFFICIENTS OF LUNAR SURFACE REGIONS WITH SOME TERRESTRIAL TYPES OF ROCKS
Barabashov, N. P., Chekirda, A. T.
Kharkov Universitet, Astronomicheskaia observatoriia, Tsirkuliar, no. 15, pp. 9–15, 1956 (in Russian)
(See also *Astronomicheskii Zhurnal*, v. 33, no. 4 pp. 549–555, 1956)
(*AJ*, 1956, #7352)

The colors at five wavelengths are determined for a number of points on the lunar surface and for 49 samples of terrestrial rocks, and comparisons are made. It is found that among the relatively few terrestrial samples, there actually are several which match the lunar surface details with respect to color.

390. STUDY OF LUNAR COLORIMETRY. II. NEW STUDIES OF THE POTSDAM SPECTROPHOTOMETRY
Sharonov, V. V.
Leningrad Universitet, Vestnik, seriia matematiki, fiziki i khimii, v. 11, no. 1, pp. 155–167, January 1956 (in Russian)

391. NATURE OF LUNAR RAYS
Alter, D.
Astronomical Society of the Pacific, Publications of the, v. 67, pp. 237–245, 1955
(*AJ*, 1955, #7361)

In a description of various radiation systems, on the basis of photographic evidence, emphasis is placed upon the characteristic properties of the rays which negate the assumption that the rays are emitted by deposits from dust clouds ejected by the central craters. A basic relationship is assumed between the rays and fissures which are not directly visible.

392. ATTEMPTED PHOTOGRAPHIC SPECTROPHOTOMETRY OF THE MOON'S SURFACE
Yezerski, V. I., Fedorets, V. A.
Astronomicheskii Tsirkuliar, no. 159, pp. 18–20, 1955 (in Russian)
(*AJ*, 1955, #7313)

Numerous spectrophotographs of lunar regions were made with the coelostat and three-prism spectographs at Kharkov and compared with one another in pairs. The comparisons, which extend to the 4400–6400 Å range, lead to the conclusion that real differences in reflectivity exist among different regions.

393. NEW VISUAL DETERMINATION OF THE MOON'S COLOR
Sharonov, V. V.
Astronomcheskii Tsirkuliar, no. 157, pp. 19–20, 1955 (in Russian)
(*AJ*, 1955, #7326)

In the spring of 1954, colorimetric observations of the integral moonlight were made with a Rosenberg blue-wedge photometer. In agreement with earlier results

obtained by the author and others, a color excess relative to the Sun of 0.332 mag was found, corresponding to a color-temperature difference of 1825° and a spectral-type difference of 0.8 spectral classes.

394. THE SCATTERING PROPERTY OF THE LUNAR SURFACE
Orlova, N. S.
Astronomicheskii Tsirkuliar, no. 156, pp. 19–21, 1955 (in Russian)
(*AJ*, 1955, #7323)

An attempt was made to determine the brightness coefficients for various i and ϵ of the lunar seas and continents from data on observations made by Fedorets and Sytinskaya-Sharonov. No appreciable differences exist in the form of the scattering properties for seas and continents.

395. SUI FENOMENI LUMINOSI DELLE RAGGIERE LUNARI (THE BRIGHTNESS PHENOMENA OF LUNAR RADIATION)
Fenaroli, R.
Coelum, Bologna, v. 23, pp. 102–107, 1955
(*AJ*, 1955, #7365)

After a brief consideration of the theories on the origin of the coronas around lunar craters, it is stated that the latter were caused by the fall of large minor planets, whose fragments formed the serrated rim, and eventually, the cones and the rays. The fragmentary structure of the rays would explain their greater brightness at full Moon, inasmuch as they throw no visible shadow during that phase.

396. THE COLOR OF THE LIGHT RAYS OF THE CRATERS TYCHO, COPERNICUS, AND KEPLER
Barabashov, N. P., Chekirda, A. T.
Kharkov Universitet, Astronomicheskaia observatoriia, Tsirkuliar, no. 13, pp. 3–13, 1955 (in Russian)
(*AJ*, 1955, #7363)

The investigation is based on photographs taken with the Kharkov Moon-Sun camera, in various colors between 3650 and 8400 Å. In spite of certain similarities in the color variation, the three systems possess significant differences which apparently have their origin in the creation of the craters and the formations surrounding them. The colors of the substances in the interior of the crater and the rays are related. In the case of Tycho, the rays are reddish up to a certain distance, and the color of the crater interior also tends strongly toward red. In Copernicus, whose reddishness is somewhat less marked, the reddish color of the rays ends closer to the center. The rays of the whitish Kepler crater are just barely reddish.

397. COLORIMETRIC INVESTIGATIONS OF THE MOON. I. VISUAL COLORIMETRY OF THE INTEGRAL MOONLIGHT
Sharonov, V. V.
Leningrad Universitet, Vestnik, v. 10, no. 11, pp. 113–120, 1955 (in Russian)
(*AJ*, 1955, #7327)

398. A TENTATIVE EXPLANATION OF THE NEGATIVE POLARIZATION IN DIFFUSE REFLECTION
Öhman, Y.
Stockholms Observatorium, Annaler, v. 18, no. 8, 1955
(*AJ*, 1955)

399. PHOTOELECTRIC OBSERVATIONS OF OCCULTATIONS
Preston, G. W., et al.
Astronomical Journal, v. 59, no. 1223, pp. 443–444, December 1954

Times and coordinates of sites are given for photoelectric observations of occultations of stars by the Moon, made as a part of a geodetic program by the Army Map Service.

400. RESULTS OF SIMULTANEOUS COMPARISON OF LUNAR OBJECTS AND ROCK FORMATIONS WITH RESPECT TO BRIGHTNESS AND COLOR
Sytinskaya, N. N.
Astronomicheskii Tsirkuliar, no. 153, pp. 17–18, 1954 (in Russian)
(*AJ*, 1954, #7357)

Whereas the image points of lunar-surface formations occupy only a small area in a chromaticity diagram, the image points of sedimentary and metamorphic rock formations occupy a considerable portion of the diagram, although the area of the lunar formations is not included. Meteorites, their molten crusts, and basic and ultrabasic metamorphic rocks occupy limited areas in the diagram and extend only slightly into the area of the lunar formations. The composition of the lunar formations is therefore different from that of the above-named terrestrial samples.

401. ATTEMPTED PETROGRAPHIC INVESTIGATION OF THE LUNAR SURFACE USING BOTH PHOTOMETRIC AND COLORIMETRIC OBSERVATIONS
Sharonov, V. V.
Astronomicheskii Zhurnal, v. 31, pp. 442–452, 1954 (in Russian)
(*AJ*, 1954, #7355)

A comparison of the composition of the lunar surface with terrestrial rock formations and with meteorites indicates that there is absolutely no agreement between their brightness or color distribution curves. Following a critical analysis of various hypotheses, the concept is adopted that the Moon's surface consists of porous, vesicular slag which was formed from the rocky crust as a result of the impact of meteorites.

402. ULTRA-VIOLET REFLECTIVITY OF THE MOON
British Astronomical Association, Journal of the, v. 64, p. 146, 1954
(*AJ*, 1954, #7323)

403. THE COLOR CONTRASTS OF THE LUNAR SURFACE
Barabashov, N. P., Chekirda, A. T.
Kharkov Universitet, Astronomicheskaia observatoriia, Uchenye Zapiski, v. 55, pp. 13–25, 1954 (in Russian)
(*AJ*, 1954, #7345)

404. COMPILATION OF RESULTS OF THE VISUAL INTEGRAL PHOTOMETRY OF THE MOON DURING ECLIPSES
Suslov, A. K.
Russkii astronomicheskii zhurnal, no. 145, pp. 13–14, 1954 (in Russian)
(*AJ*, 1954, #7328)

The courses of brightness during lunar eclipses from 1924 to 1952 are compiled from observations made in Russia. An average light curve is determined from the individual data.

405. ÜBER DIE GRÜNE ZONE DES ERD-SCHATTENS BEI MONDFINSTERNISSEN (THE GREEN ZONE OF THE EARTH SHADOW DURING LUNAR ECLIPSES)
Paetzold, H. K.
Die Sterne, v. 30, pp. 13–19, 1954
(*AJ*, 1954, #7327)

Experimental investigations of the green zone indicate that the coloration is not due to a visual contrast effect, but is actually caused by the ozone content of the Earth's atmosphere. The green color is strongly dependent on the volume and vertical distribution of the ozone.

406. LUNAR COLORS
Avigliano, D. P.
Strolling Astronomer, v. 8, pp. 50–55, 1954
(*AJ*, 1954, #7344)

407. COMPILATION OF COLOR COMPARISONS OF THE MOON AND THE SUN
Sharonov, V. V.
Astronomicheskii Tsirkuliar, no. 138, p. 7, 1953 (in Russian)
(*AJ*, 1953, #7327)

408. THE RELATIONSHIP BETWEEN THE STEPS OF THE VISUAL BRIGHTNESS SCALE OF LUNAR OBJECTS AND THE ABSOLUTE VALUES OF THE BRIGHTNESS FACTOR
Sytinskaya, N. N.
Astronomicheskii Tsirkuliar, no. 144, pp. 11–12, 1953 (in Russian)
(*AJ*, 1953, #7377)

A comparison of the old ten-step Schröter Scale *(N)* with that published by the author in a catalog in *Astronomicheskii Zhurnal*, v. 30, p. 295, 1953, on the brightness factor ρ, yielded $\rho = 0.047 + 0.136\ N$.

409. CATALOG OF THE ABSOLUTE VALUES OF VISUAL REFLECTIVITY OF 104 LUNAR FORMATIONS
Sytinskaya, N. N.
Astronomicheskii Zhurnal, v. 30, pp. 295–301, 1953 (in Russian)
(*AJ*, 1953, #7376)

Reflectivity values from various sources for 104 lunar formations are incorporated in a homogeneous system. The catalog is ultimately used for some statistical discussions.

410. THE ILLUSTRATIVE ALBEDO AS AN EXPRESSION OF THE REFLECTIVITY OF BODIES IN THE SOLAR SYSTEM
Sharonov, V. V.
Leningrad Universitet, Nauchnyi Biulleten, no. 31, pp. 6–7, 1953 (in Russian)
(*AJ*, 1953, #7025)

411. A COMPARISON OF PHOTOMETRIC OBSERVATIONS OF THE MOON WITH THE FORMULAS FOR REFLECTIVITY AND WITH EACH OTHER
Orlova, N. S.
Leningrad Universitet, Nauchnyi Biulleten, no. 31, pp. 3–4, 1953 (in Russian)
(*AJ*, 1953, #7322)

412. FARBBEOBACHTUNGEN IN MONDKRATERN (COLOR OBSERVATIONS IN LUNAR CRATERS)
Roth, G. D.
Mitteilungen für Planetenbeobachter, v. 6, p. 29, 1953
(*AJ*, 1953)

413. CALCULATION OF THE MASS OF THE LUNAR ATMOSPHERE ON THE BASIS OF POLARIZATION INVESTIGATIONS
Lipski, Yu. N.
Moscow Universitet, Gosudarstvennyi astronomicheskii institute imeni P. K. Shternberga, Trudy, v. 22, pp. 66–123, 1953 (in Russian)
(*AJ*, 1953, #7317)

Based on Fesenkov's method, formulas are derived for the determination of the light polarization of individual lunar areas. In addition, photographs of the Moon were made with the quadriform Pulkovo coronagraph at three polaroid positions, using green and blue filters. The mass of an air column 1 cm^2 in diameter is no smaller than the 2000th part of its terrestrial counterpart, assuming identical chemical composition.

414. ULTRAVIOLET SPECTRAL RADIANT ENERGY REFLECTED FROM THE MOON
Stair, R., Johnston, R.
National Bureau of Standards, Journal of Research, v. 51, pp. 81–84, 1953
(*AJ*, 1953, #7329)

415. THE ULTRAVIOLET SPECTRAL RADIANT ENERGY FROM THE MOON
Stair, R., Johnston, R.
Optical Society of America, Journal of the, v. 43, p. 328, 1953
(*AJ*, 1953, #7328)

416. THE COLOR CONTRASTS ON THE LUNAR SURFACE
Barabashov, N. P.
Priroda, v. 42, no. 12, pp. 88–90, 1953 (in Russian)
(*AJ*, 1953, #7305)

417. THE BRIGHTNESS OF LUNAR ECLIPSES
Dagayev, M. M.
Vsesoiuznoe astronomo-geodezicheskoe obshchestvo, Biulleten, no. 14 (23), pp. 52–57, 1953 (in Russian)
(*AJ*, 1953, #7339)

No connection exists between the brightness of lunar eclipses and the relative numbers of sunspots.

418. THE BRIGHTNESS OF LUNAR ECLIPSES AND SOLAR ACTIVITY
Bakharev, A. M.
Vsesoiuznoe astronomo-geodezicheskoe obshchestvo, Biulleten, no. 14 (23), pp. 50–51, 1953 (in Russian)
(*AJ*, 1953, #7337)

Observations made from 1917 to 1950 reveal no clear relationship between lunar brightness and solar activity.

419. LA COURBE DE POLARISATION DE LA TERRE ET LA NATURE DU SOL LUNAIRE (THE POLARIZATION CURVE OF THE EARTH AND THE NATURE OF THE LUNAR SOIL)
Dollfus, A.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 235, pp. 1013–1016, 1952
(*AJ*, 1952, #7305)

The polarization curve of the Earth is derived from the polarization curve of the ash-gray moonlight, taking into account the depolarizing effects. The Lyot assumption of the pulverized volcanic ash composition of the lunar surface is thus confirmed.

420. PHOTOGRAPHIC PHOTOMETRY OF THE LUNAR SURFACE
Fedorets, V. A.
Kharkov Universitet, Astronomicheskaia observatoriia, Trudy, v. 2 (10), pp. 49–172, 1952 (in Russian); *Uchenye Zapiski*, v. 42, pp. 49–172, 1952
(*AJ*, 1952, #7306)

From photographs (iso-ortho) made in Kharkov from 1948 to 1959, the brightness of numerous details as a function of the illumination ratios is determined and graphically represented.

421. STUDY OF THE REFLECTIVITY OF THE LUNAR SURFACE
Sytinskaya, N. N., Sharonov, V. V.
Leningrad Universitet, Astronomicheskaia observatoriia, Uchenye Zapiski, no. 153, pp. 114–154, 1952 (in Russian); *Trudy*, v. 16, pp. 114-154, 1953
(*AJ*, 1953, #7375)

The reflectivity B is determined for numerous selected objects on the Moon's surface for various angles of incidence i and reflection ϵ and is expressed by the ratio of the actually measured brightness B and the brightness of an ideal white surface, under equal illumination conditions B_0 and normal to the incident light B_n. Diagrams are included for each object: $\rho = B/B_n$ over phase angle ψ, and tables with i, ϵ, ρ, and $r = B/B_0 = \rho \sec i$.

422. THE PROBLEM OF THE STUDY OF THE LUNAR SURFACE USING PHOTOMETRIC AND COLORIMETRIC METHODS
Sytinskaya, N. N., Sharonov, V. V.
Leningrad Universitet, Vestnik, no. 9, pp. 97–109, 1952 (in Russian)
(*AJ*, 1952, #7320)

423. THE NATURE OF THE LUNAR SURFACE (FROM PHOTOMETRIC AND COLORIMETRIC OBSERVATIONAL DATA)
Sytinskaya, N. N.
Priroda, v. 41, no. 9, pp. 93–94, 1952 (in Russian)
(*AJ*, 1952, #7321)

Progress made in the USSR is briefly reported.

424. PUNKTE HOHER ALBEDO AUF DEM MOND UND PHOTOMETRIE DER MONDFORMATIONEN (POINTS OF HIGH ALBEDO ON THE MOON AND PHOTOMETRY OF THE LUNAR FORMATIONS)
Die Sterne, v. 28, pp. 72–73, 1952
(*AJ*, 1952, #7329)

425. A PHOTOMETRIC INVESTIGATION OF THE SLOPES AND THE HEIGHTS OF THE RANGES OF HILLS IN THE MARIA OF THE MOON
van Diggelen, J.
Astronomical Institutes of the Netherlands, Bulletin of the, v. 11, pp. 283–289, 1951
(*AJ*, 1951, #7348)

Photometric observations were made with the 40-in. Yerkes refractor of photographs of two areas in the Mare Imbrium nea rthhe terminator. Hill altitudes from 100 to 200 m and slope gradients not over 1:40 were derived. Hills from 10–20 m in height can still be discerned.

426. VARIATIONS LUMINEUSES DE LA LUNE (BRIGHTNESS VARIATIONS OF THE MOON)
Link, F.
Astronomical Institutes of Czechoslovakia, Bulletin of the, v. 2, pp. 131–133, 1951
(*AJ*, 1951, #7310)

The author compares photoelectric measurements of the Moon's brightness made by Rougier with the variations of Abbot's solar constants. According to this comparison, a correlation exists between the two sets of measurements. The variable component of the moonlight is probably due to luminescence of the lunar surface.

427. DISCUSSION PHOTOMÉTRIQUE DE RÉCENTES ÉCLIPSES DE LUNE (PHOTOMETRIC EVALUATION OF RECENT LUNAR ECLIPSES)
Link, F., Široký, J.
Astronomical Institutes of Czechoslovakia, Bulletin of the, v. 2, pp. 86–88, 1951
(*AJ*, 1951, #7328)

The following areas in the Earth shadow are important for the investigation of the Earth's upper atmosphere: penumbra near the edge of the umbra, the edges of the umbra, and the middle of the umbra. These regions are discussed for the four lunar eclipses which were observed photometrically by J. Dubois.

428. DETERMINATION OF THE POLARIZATION OF THE LUNAR AUREOLE
Lipski, Yu. N.
Moscow Universitet, Gosudarstvennyi astronomicheskii institute imeni P. K. Shternberga, Soobshcheniia, Trudy, no. 80, pp. 3–17, 1951
(in Russian)
(*AJ*, 1952, #7274)

429. DIE DURCH DIE ATMOSPHÄRISCHE OZONSCHICHT BEWIRKTE FÄRBUNG DES ERDSCHATTENS AUF DEM VERFINSTERTEN MOND (THE COLORATION OF THE EARTH'S SHADOW ON THE ECLIPSED MOON CAUSED BY THE ATMOSPHERIC OZONE LAYER)
Paetzold, H. K.
Naturwissenschaften, v. 38, pp. 544–545, 1951
(*AJ*, 1951, #7330)

Parts of the lunar surface which enter the umbra during a lunar eclipse appear red in color. This phenomenon is caused by the penetration of the Earth's atmosphere by sunlight. Color observations reveal a conspicuously greenish zone of an angular width of a few minutes. The author considers the origin of this "green zone" to lie in the atmospheric ozone layer, i.e., in the absorption in the 4500 to 7000 Å spectral region, in the so-called Chappuis bands. Conclusions can be drawn from the extent and color of the "green zone" with respect to the ozone content and the vertical ozone-distribution curve.

430. LUNAR PHOTOMETRY
Sky and Telescope, v. 11, p. 30, 1951
(*AJ*, 1951, #7317)

431. ÜBER DIE SICHTBARKEIT DER HELLEN STRAHLEN AUF DEM MONDE (THE VISIBILITY OF THE BRIGHT RAYS ON THE MOON)
Ahnert, P.
Die Sterne, v. 27, pp. 167–168, 1951
(*AJ*, 1951, #7343)

432. THE COLOR OF THE MOON AND THE EARTH
Markov, A. V.
Akademiia nauk Kazakhskoi SSR, Izvestiia, seriia astrobotanicheskaia, no. 90, pp. 92–96, 1950
(in Russian)
(*AJ*, 1950, #7311)

433. SUR LA LUMINOSITÉ DES ÉCLIPSES DE LUNE (THE LUMINOSITY OF LUNAR ECLIPSES)
Link, F.
Astronomical Institutes of Czechoslovakia, Bulletin of the, v. 2, p. 59, 1950
(*AJ*, 1950, #7343)

434. COLOR AND BRIGHTNESS OF ECLIPSED MOON
Strolling Astronomer, v. 4, no. 8, pp. 7–8, 1950
(*AJ*, 1950, #7345)

435. EINE BESTIMMUNG DER VERTIKALEN VERTEILUNG DES ATMOSPHÄRISCHEN OZONS MIT HILFE VON MONDFINSTERNISSEN (A DETERMINATION OF THE VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE WITH THE AID OF LUNAR ECLIPSES)
Paetzold, H. K.
Zeitschrift für Naturforschung, Abteilung A, v. 5, pp. 661–666, 1950
(*AJ*, 1950, #7344)

During a partial lunar eclipse, the brightness distribution near the edge of the shadow is determined in a direction vertical to the shadow by photographic photometric means, and conclusions are drawn with respect to the ozone distribution in the stratosphere. The altitude of maximum ozone content is thus found to be 22 km. Above the maximum, the ozone concentration decreases very rapidly until, above 45–50 km, ozone is no longer discernible. In addition, the observations indicate the existence of a weakly blue-absorbing layer, which is probably situated at an altitude between 200 and 100 km.

436. THE EXISTENCE OF A LUNAR ATMOSPHERE
Lipski, Yu. N.
Akademiia nauk SSSR, Doklady, v. 65, pp. 465–468, 1949 (in Russian)
(*AJ*, 1949, #7316)

437. PHOTOELECTRIC DETERMINATION OF THE BRIGHTNESS OF THE SUN AND THE MOON
Nikonova, E. K.
Akademiia nauk SSSR, Krymskaia astrofizicheskaia observatoriia, Izvestiia, v. 4, pp. 114–143, 1949 (in Russian)
(*AJ*, 1949, #6010)

438. RECHERCHE D'UNE ATMOSPHÈRE AU VOISINAGE DE LA LUNE (INVESTIGATION OF THE EXISTENCE OF A LUNAR ATMOSPHERE)
Lyot, B., Dollfus, A.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 229, pp. 1277–1280, 1949
(*AJ*, 1949, #7317)

Attempts to confirm photographically the existence of a lunar atmosphere with the coronagraph of the Pic du Midi Observatory at quadrature had negative results.

439. POLARIZATION OF EARTH-SHINE FROM THE MOON
Lyot, B., Dollfus, A.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 228, no. 23, pp. 1773–1775, 1949

This paper discusses the polarizations studied with the 20-cm Pic du Midi coronograph, between phase angles of 38 and 115 deg, during eight nights of observation between April 7 and May 9, 1949.

440. HET FOTOMETRISCH ONDERZOEK VAN HET OPPERVLAK DER MAAN (THE PHOTOMETRIC INVESTIGATION OF THE SURFACE OF THE MOON)
Minnaert, M. G. J.
Koninklijke Nederlandse Akademie Van Wetenschappen, v. 58, no. 4, pp. 25–26, 1949
(*AJ*, 1949, #7318)

441. ORTSBESTIMMUNG VON 433 PUNKTEN HOHER ALBEDO AUF EINER VOLLMONDAUFNAHME (POSITION DETERMINATIONS OF 433 POINTS WITH HIGH ALBEDO ON A FULL MOON PHOTOGRAPH)
Roth, H.
Sitzungsberichte der österreichischen Akademie der Wissenschaften, Abteilung IIa, v. 157, pp. 25–52, 1949
(*AJ*, 1949, #7321)

The rectangular and spherical coordinates of 433 selected points on the Moon's surface with high albedo are derived, reported in catalog form, and represented in four synoptical sketches of the quadrants. The lunar formations mentioned are not listed by name.

442. ZUR PHOTOGRAPHISCHEN PHOTOMETRIE DER VOLLMONDFORMATIONEN (PHOTOGRAPHIC PHOTOMETRY OF FULL MOON FORMATIONS)
Graff, K.
Sitzungsberichte der österreichischen Akademie der Wissenschaften, Abteilung IIa, v. 157, pp. 17–24, 1949
(*AJ*, 1949, #7310)

The photographic full Moon brightnesses of 79 selected areas on the Moon's disc are reported and com-

pared with 24 areas measured by P. Götz. The measured values of 35 areas in a few rays of Tycho are also included.

443. THEORETISCHE PHOTOMETRIE DES ERDMONDES (THEORETICAL PHOTOMETRY OF THE EARTH MOON)
Chunko, H. F. A.
Zeitschrift für Astrophysik, v. 26, pp. 279–294, 1949
(*AJ*, 1949, #7324)

The reflection law for the surface area of the Earth's Moon is applied to the intensity equator and, in conjunction with photometric observations made to date, the law for phase intensities is derived. From the reflection laws for thermal and light radiation it is concluded that the surface of the Moon is articulated. Photometric and more detailed albedo investigations are not included in this very abbreviated summary.

444. EXPLORATION DE LA HAUTE ATMOSPHÈRE À L'AIDE DES ÉCLIPSES DE LUNE. II. BASES NUMÉRIQUES DE LA THÉORIE PHOTOMÉTRIQUE DES ÉCLIPSES DE LUNE ET COMPARAISON DE LA THÉORIE AVEC LES OBSERVATIONS (INVESTIGATION OF THE UPPER ATMOSPHERE WITH THE AID OF LUNAR ECLIPSES. II. NUMERICAL BASES FOR THE PHOTOMETRIC THEORY OF LUNAR ECLIPSES AND COMPARISON OF THE THEORY WITH OBSERVATIONS)
Link, F.
Annales de géophysique, v. 4, pp. 211–231, 1948
(*AJ*, 1949, #7344)

445. PHOTOGRAPHIC PHOTOMETRY OF THE MOON'S SURFACE
Barabashov, N. P., Chekirda, A. T.
Kharkov Universitet, Astronomicheskaia observatoriia, Publikatsii, v. 8, pp. 29–50, 1948
(in Russian)
(*AJ*, 1948, #7303)

446. THE BRIGHTNESS DISTRIBUTION ON THE LUNAR DISC AT FULL MOON
Markov, A. V.
Russkii astronomicheskii zhurnal, v. 25,
pp. 172–179, 1948 (in Russian)
(*AJ*, 1948, #7311)

447. THE BRIGHTNESS OF THE ECLIPSED MOON
Chernov, V. M.
Astronomicheskii Tsirkuliar, no. 58, pp. 4–6, 1947
(in Russian)
(*AJ*, 1947, #5410)

Recent and older observations made by the author of the course of the brightness of eight lunar eclipses between 1927 and 1946 are compiled.

448. INDICES POUVANT SERVIR À CARACTÉRISER L'ASPECT DE LA LUNE TOTALEMENT ÉCLIPSÉE (FACTORS FOR DETERMINING THE NATURE OF THE TOTALLY ECLIPSED MOON)
Vandekerkhove, E.
Ciel et terre, v. 63, pp. 37–38, 1947
(*AJ*, 1947, #5411)

A system is suggested for determining the color and brightness of the Moon during total eclipses.

449. DER LICHTSTRAHL IM MONDKRATER PHOCYLIDES UND DESSEN ZEITBESTIMMUNG (THE LIGHT RAY IN THE LUNAR CRATER PHOCYLIDES AND ITS TIME DETERMINATION)
Rapp, K.
Orion, no. 13, pp. 241–245, 1946
(*AJ*, 1943–1946, #5457)

An approximate predetermination is made of the appearance of the radiation phenomenon of August–December 1947.

450. THE POLARIZATION OF THE LIGHT REFLECTED FROM THE LUNAR SURFACE
Fesenkov, V. G., Kramer, O. P.
Akademiia nauk SSSR, Doklady, v. 40,
pp. 152–154, 1943 (in Russian)
(*AJ*, 1943, #5410)

451. THE MASS OF THE LUNAR ATMOSPHERE
Fesenkov, V. G.
Akademiia nauk SSSR, Doklady, v. 39,
pp. 275–278, 1943 (in Russian)
(*AJ*, 1943, #5409)

452. THE REFLECTION OF LIGHT FROM THE SURFACES OF THE MOON AND OF MARS
Barabashov, N. P., Chekirda, A. T.
Russkii astronomicheskii zhurnal, v. 22, pp. 11–22, 1945 (in Russian)
(*AJ*, 1943–1946, #5403)

453. PHOTOGRAPHIC COLORIMETRY OF THE MOON
Radlova, L. N.
Russkii astronomicheskii zhurnal, v. 20, no. 5–6, pp. 1–13, 1943 (in Russian)
(*AJ*, 1943, #5424)

454. UTILISATION DES ÉCLIPSES DE LUNE À L'ÉTUDE DE LA HAUTE ATMOSPHÈRE (UTILIZATION OF LUNAR ECLIPSES IN THE STUDY OF THE UPPER ATMOSPHERE)
Barbier, D., Chalonge, D., Vigroux, E.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 214, pp. 983–984, 1942
(*AJ*, 1942)

455. DIE FARBEN DES VERFINSTERTEN MONDES (THE COLORS OF THE ECLIPSED MOON)
Waldmeier, M.
Die Himmelswelt, v. 52, p. 90, 1942
(*AJ*, 1942, #5421)

456. THE RECIPROCITY PRINCIPLE IN LUNAR PHOTOMETRY
Minnaert, M. G. J.
Astrophysical Journal, v. 93, pp. 403–410, 1941
(*AJ*, 1941, #5407)

The validity of the Helmholtz optical reciprocity principle is considered. A general reciprocity law is formulated which is independent of the surface composition, and applied to the photometric measurements of the Moon made by Öpik, Bennett, and Fesenkov. Finally, the conclusions of the reciprocity principle are applied to the general form of the illumination law of the lunar surface.

457. VISUAL COLORIMETRY OF THE MOON
Radlova, L. N.
Leningrad Universitet, Uchenye Zapiski, no. 82, pp. 99–129, 1941 (in Russian)
(*AJ*, 1943, #5423)

458. COLOR OF THE LUNAR SURFACE
Andrenko, L.
Popular Astronomy, v. 49, p. 397, 1941
(*AJ*, 1941, #5402)

The color of the lunar surface is described from observations made with a 6-in. telescope in Odessa.

459. PHOTOMETRIC OBSERVATIONS OF TWO LUNAR ECLIPSES
Merkulov, A. V.
Tashkend, Astronomicheskaia observatoriia, Biulleten, v. 2, pp. 122–136, 1940 (in Russian with English abstract)
(*AJ*, 1940)

460. MEASUREMENTS OF ABSOLUTE VALUES OF THE BRIGHTNESS FACTORS FOR DIFFERENT OBJECTS AT THE MOON SURFACE
Sharonov, V. V.
Leningrad Universitet, Zapiski, seriia astronomicheskaia, no. 31, pp. 28–60, 1939 (in Russian with English abstract)
(*AJ*, 1940, #5404)

The author determines the brightness factor; i.e., the ratio between the brightness of a mat, light-diffusive surface in any direction and the illumination of this surface. This coefficient has great advantages in comparison to the albedo. It is obtained from observations, without the need for making actual assumptions concerning the reflection law. The results of the lunar observations are presented for various phases.

461. A PHOTOVISUAL INVESTIGATION OF THE BRIGHTNESS OF 59 AREAS ON THE MOON
Bennett, A. L.
Astrophysical Journal, v. 88, pp. 1–26, 1938
(*AJ*, 1938, #5403)

The surface brightness of 59 regions on the Moon is determined, using an explicitly described photometric method, from 11 photographs of the Moon taken at 11 different phase angles. The variation in brightness with phase angle is similar for all of the areas; the maximum is always approached at full Moon, and, in addition to the dependence on incident angle and reflection angle, a strong dependence on azimuth between incident and reflected rays is manifested. An attempt is made to explain the observations by the assumption that the otherwise smooth surface of the Moon is covered with

hemispherical depressions similar to those in pumice stone. For small reflection angles, very good agreement is obtained; for larger angles, the agreement is less good. The strong dependence on azimuth found in this study also indicates that the assumptions made are a step in the right direction.

462. COMPARAISON PHOTOMÉTRIQUE DE LA LUNE ET DU SOLEI. ALBEDO PHOTOELECTRIQUE DE LA LUNE (PHOTOMETRIC COMPARISON OF THE MOON AND THE SUN. PHOTOELECTRIC ALBEDO OF THE MOON)
Rougier, G.
Annales de l'observatoire de Strasbourg, v. 3, fasc. 5, pp. 257–282, 1937
(*AJ*, 1937, #4113)

Observations of the Sun and Moon made with the aid of a specially constructed photoelectric photometer in August 1935 and May 1936 are described. The difference in brightness between the Sun and the full Moon with respect to the average distance from the Earth to the Sun, $m_{\odot} - m_{\mathbb{C}} = -27.24$ mag. From this, using Bond's definition, the albedo of the Moon is derived at $A_k = 0.055$. The color index of the Moon is $C_{\mathbb{C}} = +1.10$ mag.

463. FÄRBUNGEN AUF DER MONDOBERFLÄCHE (COLORATIONS ON THE MOON'S SURFACE)
Kaiser, H. K.
Die Himmelswelt, v. 47, pp. 110–111, 1937
(*AJ*, 1937, #5455)

Results of observations made by the Breslau Astronomical Association from January 1934 to the beginning of 1937 are presented.

464. COLOR CHANGES ON THE MOON
Popular Astronomy, v. 45, pp. 337–341, 1937
(*AJ*, 1937, #5449)

465. COMPARAISON PHOTOMÉTRIQUE DE LA LUNE ET DU SOLEIL. ALBEDO PHOTOELECTRIQUE DE LA LUNE (PHOTOMETRIC COMPARISON OF THE MOON AND THE SUN. PHOTOELECTRIC ALBEDO OF THE MOON)
Rougier, G.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 202, pp. 463–465, 1936
(See also *Journal de physique et le radium,* (7), v. 7, pp. 156–157, 1936)
(*AJ*, 1936, #4115)

466. ON THE DETERMINATION OF THE ABSOLUTE REFLECTIVITY OF MOON AND PLANETARY SURFACES
Sharonov, V. V.
L'Observatoire astronomique de l'université de Leningrad, Publications de, v. 6, pp. 26–33, 1936 (in Russian with English abstract)
(*AJ*, 1936, #5121)

The author points out that the main purpose of photometric measurements of the Moon and the planets must be the absolute determination of the brightness coefficient of individual points on the surface of these bodies. Various methods for absolute determination are suggested.

467. LUNAR RADIATION AS RELATED TO PHASE
Pettit, E.
Astrophysical Journal, v. 81, pp. 17–36, 1935
(*AJ*, 1935, #5412)

The thermoelectric radiometer and the method of observation are described. The measurements are discussed. The radiometric brightness at full Moon is for the total radiation.

468. PHOTOMÉTRIE GLOBALE DE LA LUNE (TOTAL PHOTOMETRY OF THE MOON)
Rougier, G.
L'Astronomie, v. 48, pp. 220–233, 281–288, 1934
(See also *Société française de physique, Bulletin bi-mensuel,* no. 326, 116 pp.)
(*AJ*, 1934, #5411)

A detailed report on methods and results is presented. The light curve of the Moon is derived.

469. THE INTEGRAL BRIGHTNESS OF THE ASH-GRAY MOONLIGHT
Chernov, V. M.
Bulletin of the Observers Corporation of the Astronomical Geodetic Society of USSR, Moscow, v. 26–27, pp. 107–108, 1934 (in Russian with French abstract)
(*AJ*, 1934, #5423)

The brightness of the ash-gray light varies between −2.0 and 1.0 mag, increasing before full Moon and decreasing thereafter. The brightness is the same in the morning and evening.

470. L'ÉCLAT GLOBAL DE LA LUMIÈRE CENDRÉE ET L'ÉCHELLE DU PROFESSEUR PLASSMANN (TOTAL BRIGHTNESS OF THE ASH-GRAY LIGHT AND THE PLASSMANN SCALE)
Chernov, V. M.
Gazette astronomique, v. 21, pp. 108–109, 1934
(*AJ*, 1934, #5425)

The conversion of Plassmann's scale into orders of magnitude is discussed.

471. ÜBER DIE HELLIGKEIT BEI MOND-FINSTERNISSEN (BRIGHTNESS DURING LUNAR ECLIPSES)
Fedtke, C.
Die Himmelswelt, v. 44, pp. 74–76, 1934
(*AJ*, 1934, #5414)

472. PHOTOMÉTRIE GLOBALE DE LA LUNE. PHOTOMÉTRIE DES SURFACES RUGUEUSES (TOTAL PHOTOMETRY OF THE MOON. PHOTOMETRY OF ROUGH SURFACES)
Rougier, G.
Journal de physique et le radium, v. 5, (7), pp. 25–26, 1934
(*AJ*, 1934, #5410)

473. ABSOLUTE MEASUREMENTS OF THE ILLUMINATION BY THE MOON AT DIFFERENT PHASES
Sharonov, V. V.
Russkii astronomicheskii zhurnal, v. 11, pp. 225–231, 1934 (in Russian with English abstract)
(*AJ*, 1934, #5413)

The illumination is determined with the aid of a Trotter lightmeter and a Graff photometer, and an illumination table is presented.

474. PHOTOMÉTRIE PHOTOÉLECTRIQUE GLOBALE DE LA LUNE (TOTAL PHOTO-ELECTRIC PHOTOMETRY OF THE MOON)
Rougier, G.
Annales de l'observatoire de Strasbourg, v. 2, fasc. 3, pp. 205–339, 1933
(*AJ*, 1933, #5426)

The dependence on phase of the brightness of moonlight is investigated using a photoelectric photometer. The apparatus and method are discussed and the changes in atmospheric absorption are examined in greater detail.

475. PHOTOMETRIC THEORY OF LUNAR ECLIPSES
Link, F.
Bulletin astronomique (2), v. 8, pp. 77–108, 1933 (in French)
(See also *Comptes rendus hebdomadaires des séances de l'académie des sciences*, v. 196, p. 251, 1933)
(*AJ*, 1933, #5416)

The importance of photometric measurements of lunar eclipses in the investigation of the highest atmospheric layers is emphasized, and a method is described for calculating the optical densities of the shadow. This method has succeeded in ascertaining the horizontal refraction and its variation with altitude and air mass for each kilometer of altitude between 2 and 40 km. On the basis of these results, the optical densities of the shadow are calculated.

476. EIN FARBEN- UND PHASENEFFEKT BEI STERNBEDECKUNGEN (COLOR AND PHASE EFFECTS DURING STELLAR OCCULTATIONS)
Schembor, F.
Vierteljahresschrift der astronomischen Gesellschaft, Leipzig, v. 68, pp. 356–358, 1933
(*AJ*, 1933, #5408)

477. CONTRIBUTIONS TO THE PHOTOMETRIC THEORY OF LUNAR ECLIPSES
Fesenkov, V. G.
Bulletin de l'academie des sciences de l'Union RSS, (7), no. 1, pp. 9–20, 1932
(*AJ*, 1932, #5407)

478. BEOBACHTUNGEN ÜBER DIE HELLIGKEITSSCHWANKUNGEN DES ASCHGRAUEN MONDLICHTES (OBSERVATIONS CONCERNING THE BRIGHTNESS VARIATIONS OF THE ASH-GRAY MOONLIGHT)
Grimm, H.
Die Himmelswelt, v. 42, p. 32, 1932
(*AJ*, 1932, #5416)

479. THE MEASUREMENT OF LUNAR COLOR DIFFERENCES
Keenan, P. C.
Astronomical Society of the Pacific, Publications of the, v. 43, pp. 203–214, 1931
(*AJ*, 1931, #5417)

Measurements are given of the surface brightness of distinct objects within the ultraviolet to infrared spectral region.

480. EL BRILLO TOTAL DE LA LUNA ECLIPSADA Y DE LA LUZ CENICIENTA (THE TOTAL BRIGHTNESS OF THE ECLIPSED MOON AND OF ITS ASH-GRAY LIGHT)
Chernov, V. M.
Revista de la sociedad astronómica de España y América, Barcelona, v. 22, p. 75, 1931
(*AJ*, 1931, #5408)

A comparison is made of the brightness of the lunar eclipses of 1924, 1927, and 1931.

481. COLOR PHENOMENA DURING LUNAR ECLIPSES
Von dem Borne, H.
Meteorologische Zeitschriften, v. 47, pp. 416–418, 1930
(*AJ*, 1930, #5420)

482. SOME PHOTOMETRICAL RESEARCHES ON THE MOON
Fesenkov, V. G., Parenago, P.
Russkii astronomicheskii zhurnal, v. 6, pp. 279–284, 1930 (in English with Russian abstract)
(*AJ*, 1930, #5423)

The paper is a continuation of the photometric investigations which were described in detail in Fesenkov's "Photometry of the Moon" [Entry #490]. On the basis of the same observational material, the variations in the brightness of the lunar edge near the lunar equator are investigated, the intensities for various lunar phases are derived, and the course of the total brightness as a function of phase is established. In addition, the article discusses the temperature characteristic I/T derived from colorimetric measurements in various regions of the lunar maria.

483. DIE HELLIGKEITSSCHWANKUNGEN DES ASCHGRAUEN MONDLICHTES (THE BRIGHTNESS VARIATIONS OF THE ASH-GRAY MOONLIGHT)
Goldberg, J.
Zeitschrift für Geophysik, v. 7, pp. 345–348, 1930
(*AJ*, 1930, #5415)

The brightness of the ash-gray light is mainly dependent on the high albedo of the tropical overcast.

484. BEOBACHTUNGEN ÜBER DIE HELLIGKEITSSCHWANKUNGEN DES ASCHGRAUEN MONDLICHTES (OBSERVATIONS OF THE BRIGHTNESS VARIATIONS OF THE ASH-GRAY MOONLIGHT)
Grimm, H.
Zeitschrift für Geophysik, v. 7, pp. 92–94, 1930
(*AJ*, 1930, #5430)

485. DETERMINATION OF THE COLOR OF THE LUNAR SEAS
Fesenkov, V. G.
Astronomische Nachrichten, v. 236, pp. 7–8, 1929
(*AJ*, 1929, #5424)

The investigations by A. Danjon reported in *Annales de l'observatoire de Strasbourg*, v. 2, are discussed.

486. PHOTOMETRISCHE UNTERSUCHUNGEN ÜBER DAS ASCHGRAUE MONDLICHT (PHOTOMETRIC INVESTIGATIONS CONCERNING THE ASH-GRAY MOONLIGHT)
Sticker, B.
Die Himmelswelt, v. 39, pp. 189–193, 1929
(*AJ*, 1929, #5420)

The investigations by A. Danjon reported in *Annales de l'observatoire de Strasbourg*, v. 2, are discussed.

487. THE QUALITY OF THE LIGHT OF THE ECLIPSED MOON
Millman, P. W.
Royal Astronomical Society of Canada, Journal of the, v. 23, pp. 201–207, 1929
(*AJ*, 1929, #5413)

Photographs made with color filters indicate that as the Moon enters the shadow, the ratio of blue to red increases at first, whereas, during total eclipse, red predominates.

488. PHOTOMETRIC STUDIES OF THE LUNAR SURFACE

Fesenkov, V. G.

***Russkii astronomicheskii zhurnal*, v. 5, no. 4, pp. 219–235, 1929 (in Russian with English abstract) (*AJ*, 1929, #5418)**

Lunar photographs taken by V. Surovcev with the Tashkend Observatory normal astrograph were used by the author for his photometric studies, in order to formulate the law governing the reflection of the rays of the Sun by the lunar surface at various angles of incidence.

The plates were measured with a Hartmann microphotometer at the Astrophysics Institute of Moscow. The scale of a tube photometer was superimposed on the plates and served to convert the photographic densities into brightnesses. The influence of the aureole was taken into account.

Discussion of the measurements leads to the conclusion that for all lunar phases from 0 to 140 deg, the photometric determinations could be represented by a simple formula which constitutes a modification of the well-known Lommel-Seeliger law.

489. ÉTUDE PHOTOMÉTRIQUE DE LA LUMIÈRE CENDRÉE DE LA LUNE (PHOTOMETRIC STUDY OF THE ASH-GRAY LIGHT OF THE MOON)

Danjon, A.

***Comptes rendus hebdomadaires des séances de l'académie des sciences*, v. 187, pp. 336, 1928 (*AJ*, 1929, #5419)**

The Earth's albedo is derived at 0.29.

490. PHOTOMETRY OF THE MOON

Fesenkov, V. G., Staude, N., Parenago, P.

***L'Institute astrophysique de Russie, Publications de*, v. 4, fasc. 1, pp. 9–90, 1928 (*AJ*, 1928, #5421)**

The main purpose of this photometric investigation was to establish a homogeneous system for determining the brightness of numerous surface points scattered at regular intervals over the visible lunar disc. Photographs of the Moon taken by Surovcev at the Tashkend Observatory in 1923 and 1924 served as the observational material. All pictures were made using the normal astrograph, with an exposure time of 8 sec and diaphragming of the objective up to 16 cm. In addition to the image of the Moon, the pictures contain a few extrafocal images of the polar star (α Ursae Minoris), which were taken at various predetermined exposure times and with the plate holder displaced 8 cm toward the outside. Seventeen of these plates were measured with a Hartmann microphotometer, from 2 mm to 2 mm in both coordinates. The rectangular coordinates of all points were reduced to a uniform system, which starts at the center of the lunar disc and whose abscissa coincides with the so-called intensity equator.

The photographic densities computed from the wedge readings were converted to brightnesses. For this purpose, the density scale of a tube photometer had been superimposed on the plates before they were developed. The brightnesses of the extrafocal pictures of the polar star determined in the course of the study make it possible to compare all measured brightness magnitudes with one another and to incorporate them in a single system on the basis of a conventional brightness unit. Various systematic errors (background brightness, aureole effect, etc.) have been carefully eliminated from the results of this study and are tabulated at the end of the report.

In the conclusion, the dependence of the brightness of various lunar-surface areas on the angles of incidence and of reflection, as well as on phase, was studied. On the basis of this, the fact that each element on the lunar disc attains its maximum apparent brightness at full Moon was established.

491. PHOTOGRAPHIC PHOTOMETRY OF 31 LUNAR AREAS

Barabashov, N. P.

***Kharkov Universitet, Astronomicheskaia observatoriia, Publikatsii*, v. 1, pp. 35–54, 1928 (*AJ*, 1928, #5422)**

Using a reflector with a 10½-in. aperture, constructed by the author in 1923, 30 Moon photographs were examined photometrically.

492. DAS ASCHFARBIGE MONDLICHT (THE ASH-GRAY MOONLIGHT)
von Böhm, A.
Meteorologische Zeitschriften, v. 45, pp. 106–107, 1928
(*AJ*, 1928, #5434)

A historical discussion of the ash-gray moonlight is presented.

493. TREATMENT OF PHOTOMETRIC OBSERVATIONS OF DETAILS ON THE MOON'S SURFACE
Natanson, S. G.
Mirovedenie, v. 17, pp. 39, 272, 1928 (in Russian)
(*AJ*, 1928, #5423)

494. I MARI DELLA LUNA (THE LUNAR MARIA)
Armellini, G.
Astronomische Nachrichten, v. 229, p. 333, 1927
(*AJ*, 1927, #5425)

This is a short note stating that the albedo of the maria corresponds to the lava flows of Aetna and Vesuvius.

495. THE ABSOLUTE PHOTOGRAPHIC BRIGHTNESS OF DETAILS OF THE LUNAR SURFACE
Markov, A. V.
Astronomische Nachrichten, v. 231, pp. 57–68, 1927
(*AJ*, 1927, #5414)

The absolute brightness, reflection coefficient, and albedo are determined for 20 points on the Moon's surface.

496. PHOTOGRAPHIC BRIGHTNESS AND REFLECTIVITY OF A FEW INDIVIDUAL SITES ON THE MOON'S SURFACE
Markov, A. V.
Russkii astronomicheskii zhurnal, v. 4, pp. 60–87, 1927 (in Russian with English abstract)
(*AJ*, 1927, #5413)

An extensive investigation is made of a photograph of the full Moon on the basis of microphotometric measurements of the plates made with the Pulkovo normal astrograph on March 28, 1926.

497. SOME THEORETICAL CONSIDERATIONS CONCERNING THE EFFECT OF THE AUREOLE FOR THE FULL MOON
Staude, N.
Russkii astronomicheskii zhurnal, v. 4, pp. 20–27, 1927 (in French with Russian abstract)
(*AJ*, 1927, #5415)

The problem is treated in a purely theoretical manner; i.e., a general form is analytically developed for the dependence of the coronal brightness on the distance of a point from the center of the lunar disc. Comparison of the values calculated by means of this formula with tables computed by the mechanical-quadrature method shows satisfactory agreement.

498. POLARIZATION OF LIGHT REFLECTED FROM ROUGH SURFACES WITH SPECIAL REFERENCE TO LIGHT REFLECTED BY THE MOON
Wright, F. E.
Washington National Academy Proceedings, v. 13, pp. 535–540, 1927
(*AJ*, 1927, #5412)

Measurements by the author show that only 15–25% of the moonlight is polarized during the first and last quarters. The Moon's surface probably consists of pumice-stonelike silicates and mixed rocks.

499. POLARIMETRISCHE BEOBACHTUNGEN AN DER MONDOBERFLÄCHE UND AN GESTEINEN (POLARIMETRIC OBSERVATIONS OF THE LUNAR SURFACE AND OF ROCKS)
Barabashov, N. P.
Astronomische Nachrichten, v. 229, pp. 7–14, 1926
(*AJ*, 1926, #5421)

Comparative photo-polarimetric measurements of the lunar surface and terrestrial rock forms agree with the results of the author's spectral investigations, which indicate that the lunar seas consist of lava-type masses and

the bright areas of sand or clay. The darkest places are perhaps obsidian or pitch stone.

500. REDUCTION OF PHOTOMETRICAL OBSERVATIONS OF THE MOON FOR EFFECT OF AUREOLE
Fesenkov, V. G., Staude, N., Winogradova, E., Barantzeva, M.
***Russkii astronomicheskii zhurnal*, v. 3, no. 2, pp. 75–91, 1926 (in Russian)**
(*AJ*, 1926, #5423)

The initial results of photometric measurements on photographic Moon exposures require correction because of the effect of the aureole. After the development of general formulas, the authors provide detailed numerical tables which make possible a simple calculation of this correction for a specified atmospheric condition and phase of the Moon.

501. ON THE REFLECTION OF LIGHT FROM THE LUNAR SURFACE
Markov, A. V., Barabashov, N. P.
***Russkii astronomicheskii zhurnal*, v. 3, no. 1, pp. 55–60, 1926 (in Russian)**
(*AJ*, 1926, #5422)

The paper treats the question: Which form of the reflection law best represents the conditions observed on the Moon? The author concludes that the laws proposed by Seeliger and Fesenkov best fit these conditions.

502. "ÜBER DAS LICHT DES MONDES." EINE UNTERSUCHUNG VON IBN AL HAITHAM ("CONCERNING THE LIGHT OF THE MOON." AN INVESTIGATION BY IBN AL HAITHAM)
Kohl, K.
***Sitzungsberichte der physikalisch-medizinischen Sozietät Erlangen*, v. 56–57, pp. 305–398, 1926**
(*AJ*, 1926, #5420)

A thorough evaluation of this study is presented. Not only is the factual content reproduced, but one receives an insight into the research methods of this great Arabian scholar.

503. PHOTOMETRISCHE UNTERSUCHUNGEN DER MONDOBERFLÄCHE (PHOTOMETRIC INVESTIGATIONS OF THE LUNAR SURFACE)
Markov, A. V., Barabashov, N. P.
***Astronomische Nachrichten*, v. 226, pp. 129–144, 1925**
(*AJ*, 1925, #5413)

It is the purpose of the study to resolve the disagreement between Markov's and Barabashov's results. This is accomplished by a thorough investigation by Markov of the illumination law for porous bodies and subsequent comparison of the theoretical results with the empirical observations.

504. COMPARISON OF A PUNCTIFORM IMAGE OF THE MOON WITH STARS BY SEQUENTIAL ESTIMATION
Selivanov, S.
***Mirovedenie*, no. 1–2, 1925 (in Russian)**
(*AJ*, 1925)

505. PHOTOMETRIC OBSERVATIONS MADE IN THE SCHICKARD REGION
Markov, A. V.
***Mirovedenie*, no. 1–2, 1925 (in Russian)**
(*AJ*, 1925)

506. ÉTUDES SPECTROPHOTOMÉTRIQUES DE LA SURFACE LUNAIRE (SPECTROPHOTOMETRIC STUDIES OF THE LUNAR SURFACE)
Barabashov, N. P.
***Russkii astronomicheskii zhurnal*, v. 1 (3–4), pp. 44–57, 1925 (in French with Russian abstract)**
(*AJ*, 1925, #5414)

The author elaborates on his investigations of the Moon's surface, the results of which he had already reported in 1924. Color index and albedo values are derived for various points of the lunar surface, and the results are compared with Wilsing's measurements of terrestrial rock formations.

507. FORMULAE AND TABLES FOR THE REDUCTION OF LUNAR OBSERVATIONS AND PHOTOGRAPHS
Graff, K.
***Royal Astronomical Institute of Mathematics, Publications of the*, Berlin, no. 14, 1901**

SATURN

Reports

508. PHOTOMETRIC ANALYSIS OF THE STRUCTURE OF THE RINGS OF SATURN
Bobrov, M. S.
1950
Lomonossov State University, Moscow, USSR
Thesis (in Russian)

Periodicals

509. THE ABSOLUTE BRIGHTNESS OF THE B-RING OF SATURN
Bobrov, M. S.
Astronomicheskii Zhurnal, v. 36, no. 5, pp. 863–866, 1959
Translated from the Russian in *Soviet Astronomy—AJ*, v. 3, no. 5, pp. 839–841, March–April 1960

It is shown that the value 0.43 obtained by Lebedinets for the absolute brightness $b_B(0)$ of the most intense region of the B-ring is underestimated; it should be $b_B(0) = 0.51 \pm 15\%$. (*PA*, 1960, #18,701)

510. MESURES PHOTOMÉTRIQUES DE SATURN ET DE SON ANNEAU (PHOTOMETRIC MEASUREMENTS OF SATURN AND OF ITS RING)
Camichel, H.
Annales d'astrophysique, v. 21, no. 5, pp. 231–242, September–October 1958 (in French)

Photometric measurements of Saturn photographs, obtained at the Pic du Midi Observatory since 1943, give the brightness of the three rings and of the Saturn belts, the brightness of the equatorial zone being taken as unity. It is found that the brightness of B decreases with aperture; there are also brightness variations along the rings. (*PA*, 1960, #4879)

511. ATTEMPTED SPECTROPHOTOMETRY OF SATURN
Teifel', V. G., Teifel', Y. A.
Astronomicheskii Tsirkuliar, no. 188, pp. 14–16, 1958 (in Russian)
(*AJ*, 1958, #7711)

A photographic spectrophotometric study was made between 4000 and 5800 Å for ring and disc edge. Also, in connection with η Oph, color indexes of these objects and of the center of the disc were determined.

512. ABSOLUTE PHOTOMETRY OF JUPITER AND SATURN WITH LIGHT FILTERS
Lebedinets, V. N.
Kharkov Universitet, Astronomicheskaia observatoriia, Trudy, v. 12, pp. 167–239, 1957 (in Russian)
(*AJ*, 1957, #7607)

This extensive monograph includes: Report on Work on the Surface Photometry of Jupiter and Saturn; The Brightness Distribution on the Discs of Jupiter and Saturn; Absolute Photometry of Jupiter and Saturn; Conclusion.

513. INTEGRAL COLORIMETRY OF SATURN IN 1954
Sharonov, V. V.
Astronomicheskii Tsirkuliar, no. 159, p. 20, 1955 (in Russian)
(*AJ*, 1955, #7710)

The color measurements made in Eysk with a Rosenberg blue-wedge astrophotometer yield a color index of +0.18 mag relative to the Sun.

514. AN UNUSUAL OPPORTUNITY TO ESTIMATE THE BRIGHTNESSES OF THE SATELLITES OF SATURN
Haas, W. H.
Strolling Astronomer, v. 9, pp. 138–142, 1955
(*AJ*, 1955, #7704)

515. AN ANALYSIS OF SATURN INTENSITY OBSERVATIONS 1946–7 AND 1947–8
Lenham, A. P.
British Astronomical Association, Journal of the, v. 63, pp. 39–41, 1953
(*AJ*, 1952, #7708)

516. THE STRUCTURE OF SATURN'S RINGS. I. DEGREE OF ROUGHNESS AND ALBEDO OF THE B-RING PARTICLES
Bobrov, M. S.
***Astronomicheskii Zhurnal*, v. 29, pp. 334–340, 1952 (in Russian)**
(*AJ*, 1952, #7704)

An optical density of 0.7 is derived from the finding that, at certain angles of inclination, the ring is partially penetrable by starlight and by light from Saturn itself. Using the Ambarzumian-Sobolev scattering theory, it is then possible to compute the fraction of back-reflected sunlight in units of the average value of the sunlight reflected in all directions. The resultant high value, $x(\pi) = 5.3$, does not include diffraction. Since Lambert's law for smooth spheres gives a value of only 2.6 for $x(\pi)$, the particles must be quite rough and large, about 0.7, and their albedo must also be large.

517. THE BRIGHTNESS DISTRIBUTION ON THE DISC OF SATURN AND THE BRIGHTNESS OF ITS RINGS
Barabashov, N. P., Chekirda, A. T.
***Kharkov Universitet, Astronomicheskaia observatoriia, Trudy*, v. 2 (10), pp. 9–16, 1952 (in Russian); *Uchenye Zapiski*, v. 42, pp. 9–16, 1952**
(*AJ*, 1952, #7703)

The very best of 700 Saturn photographs taken in four colors with the Sun and Moon camera at Kharkov were selected and evaluated photometrically. The following are discussed in particular: (1) the brightness distribution in two bands; (2) comparisons with earlier measurements; (3) the brightness distribution along the central meridian; (4) the brightness of the brightest area of the middle ring relative to the center of Saturn's disc and comparisons with earlier measurements.

518. RESULTS OF THE PHOTOMETRY OF SATURN
Barabashov, N. P.
***Kharkov Universitet, Astronomicheskaia observatoriia, Trudy*, v. 1 (9), pp. 11–17, 1951 (in Russian)**
(*AJ*, 1951, #7703)

519. DER LICHTWECHSEL DES SATURN-SATELLITEN JAPETUS IM JAHRE 1949 (THE LIGHT VARIATION OF SATURN'S SATELLITE JAPETUS IN 1949)
Widorn, T. R.
***Sitzungsberichte der österreichischen Akademie der Wissenschaften, Abteilung IIa*, v. 159, pp. 189–199, 1950**
(*AJ*, 1950, #7707)

Japetus manifests a very strange brightness variation. Visual photometric studies were made of this satellite in 1949 with the 67-cm refractor of the Vienna University Observatory, and a light curve was prepared. This curve is compared with all currently available measurements and explained theoretically. It is quite probable that, in the bright regions of the satellite, changes, possibly of a periodic nature, are taking place.

520. DER PHYSISCHE LICHTWECHSEL DER PLANETEN SATURN UND URANUS (THE PHYSICAL LIGHT VARIATION OF THE PLANETS SATURN AND URANUS)
Becker, W.
***Astronomische Nachrichten*, v. 277, pp. 65–72, 1949**
(*AJ*, 1949, #7704)

All known brightness observations of the planets Saturn and Uranus made since 1852 are reduced and compiled. This paper is concerned almost exclusively with sequential estimates. For Saturn, after reduction of the observed brightnesses to mean opposition and disappearing ring, a physical light variation is yielded which is characterized by rounded maxima and pointed minima. The average amplitude is 0.33 mag. Thus far, white spots have appeared on Saturn's surface only at the minima. In the case of Uranus, the oblate light variation of an 84-year periodicity and the physical light variation, whose course is sinusoidal and whose period fluctuates between 5.5 and 11.5 years (with an average of eight years), are superimposed on one another. The former has an amplitude of 0.255 mag and, on the basis of the Seeliger illumination theory, results in an oblateness of $a/b = 1.16$. The physical light variation has an average amplitude of 0.29 mag. Particularly low minima for Saturn and Uranus coincide with each other and with a sunspot minimum. However, comparison of the course of the sunspot curve and the two light curves shows no evidence of a basic connection between the phenomena.

521. MONOCHROMATICAL PHOTOMETRY OF SATURN'S RINGS
Furdylo, V. D.
Kharkov Universitet, Astronomicheskaia observatoriia, Publikatsii, no. 7, pp. 53–68, 1941 (in Russian with English abstract)
(*AJ*, 1941, #5805)

522. DETERMINATION OF JUPITER'S AND SATURN'S COLORS BY PHOTOMETRICAL AND COLORIMETRICAL OBSERVATIONS
Radlova, L. N.
Russkii astronomicheskii zhurnal, v. 16, no. 5, pp. 41–50, 1939 (in Russian with English abstract)
(*AJ*, 1939, #5722)

At the Tashkend Observatory, the colors of Saturn and Jupiter were studied with color filters and a colorimeter with a blue wedge, and were compared with extrafocal pictures of the planets and stars. The colorimeter had a higher accuracy than the color filters. The color equivalents of the planets are: Jupiter 0.99 (Spectrum *F*9), Saturn 1.18 (Spectrum *G*3.)

523. DER LICHTWECHSEL DER SATURN-TRABANTEN TITAN UND JAPETUS IM JAHRE 1922 (THE LIGHT VARIATION OF SATURN'S SATELLITES TITAN AND JAPETUS IN 1922)
Graff, K.
Sitzungsberichte der österreichischen Akademie der Wissenschaften, Abteilung IIa, Mathematisch-naturwissenschaftliche Klasse, Vienna, v. 148, pp. 49–57, 1939
(*AJ*, 1939, #5803)

A critical investigation is presented of a series of measurements made by Pickering, Wendell, and Guthnick to resolve the question of whether, and within what limits, the current light variations of Saturn's moons may be depended upon.

524. ABSOLUTE PHOTOGRAPHIC PHOTOMETRY OF SATURN'S DISC
Sharonov, V. V.
Pulkovo, Astronomicheskaia observatoriia, Tsirkuliar, no. 26/27, pp. 37–51, 1936–1937 (in English with Russian abstract)
(*AJ*, 1939, #5808)

The photographs of Saturn taken with the 30-in. refractor of the Pulkovo Observatory are discussed.

525. LA RECENTE SCOMPARSA DELL'ANELLO DI SATURNO (THE RECENT DISAPPEARANCE OF SATURN'S RING)
Maggini, M.
La ricerca scientifica, Rome, (2), v. 1, pp. 185–195, 1937
(*AJ*, 1937, #5806)

A report is presented of the photometric measurements of Saturn's ring made by the author at the Collurania (Teramo) Observatory at the time of its disappearance (June 1936–February 1937). The existence of rarefied, probably corpuscular, matter outside the plane of the ring is assumed from the selective absorption of the radiation reflected from the illuminated surface of the planet. Moreover, it is discovered that the north side of the ring was still visible when the Sun had already passed over its plane and was illuminating the ring from the south side.

526. ON THE ABSOLUTE DETERMINATION OF THE BRIGHTNESS FACTOR OF THE SURFACE OF SATURN
Sharonov, V. V.
Erivan, Astronomicheskoi observatorii, Biulleten, v. 1, p. 58, 1935 (in Russian)
(*AJ*, 1938, #5803)

This is a report on the brightness observations of Saturn which were undertaken in 1935 at the Erivan Observatory with the 9-in. refractor and a Rosenberg photometer.

527. ON THE ATMOSPHERES OF JUPITER AND SATURN
Barabashov, N. P., Semeykin, B. E.
Russkii astronomicheskii zhurnal, v. 11, pp. 301–304, 1934 (in Russian with English abstract)
(*AJ*, 1934, #5703)

The results of photometric studies made by the authors are as follows: (1) The absorption in the atmospheres of Jupiter and Saturn is large. (2) Since the indicatrix of diffusion is unsymmetrical, Rayleigh's law is hardly applicable to the atmospheres of these planets. (3) It is quite probable that the latter constitute a diffuse medium in which particles swim whose circumference is bigger than λ.

528. PHOTOGRAPHISCHE PHOTOMETRIE DES PLANETEN JUPITER UND UNTERSUCHUNGEN DER JUPITER- UND SATURN-ATMOSPHÄREN (PHOTOGRAPHIC PHOTOMETRY OF JUPITER AND INVESTIGATIONS OF THE ATMOSPHERES OF JUPITER AND SATURN)
Barabashov, N. P., Semeykin, B. E.
Zeitschrift für Astrophysik, v. 8, pp. 179–189, 1934
(*AJ*, 1934, #5704)

The results of photometric measurements of Jupiter are reported. The most important conclusions are: (1) The atmosphere of Jupiter is very different from those of Mars and the Earth. (2) It manifests a strong absorptivity and little scattering. (3) Rayleigh's scattering law is not valid for Jupiter's atmosphere. (4) The atmosphere is probably filled with solid particles.

529. THE ALBEDO AND BUILDING OF SATURN'S RINGS
Harrison, E.
British Astronomical Association, Journal of the, v. 43, pp. 58–65, 1933
(*AJ*, 1933, #5808)

530. MONOCHROMATIC PHOTOMETRY OF SATURN AND ITS RINGS
Barabashov, N. P., Semeykin, B. E.
Russkii astronomicheskii zhurnal, v. 10, pp. 381–391, 1933 (in Russian with English abstract)
(*AJ*, 1933, #5812)

A report is presented on photometric measurements made with filters of the surface brightness of Saturn and its rings along the central meridian and the intensity equator. In both cases, the degree of brightness decreases with changes in λ; however, in the first case, the brightness decrease is greater with all filters than in the second. In the blue radiation, the brightness of the region between the inner ring and the disc does not drop to zero, which indicates the existence of matter in this space. The radiation law is best represented by the equation $f(\epsilon, i) = \cos \epsilon$.

531. PHOTOMETRIE DES PLANETEN SATURN UND SEINES RINGSYSTEMS DURCH FARBFILTER (PHOTOMETRY OF SATURN AND ITS RING SYSTEM USING COLOR FILTERS)
Barabashov, N. P., Semeykin, B. E.
Zeitschrift für Astrophysik, v. 7, pp. 290–302, 1933
(*AJ*, 1933, #5811)

The brightness distribution on the disc and ring is determined, and several laws of reflection are discussed. The brightness of the rings appears to be influenced by internal processes.

532. EINIGE PHOTOMETRISCHE BEOBACHTUNGEN AM GROSSEN REFRAKTOR DER WIENER UNIVERSITÄTSSTERNWARTE (SOME PHOTOMETRIC OBSERVATIONS MADE WITH THE LARGE REFRACTOR OF THE VIENNA UNIVERSITY OBSERVATORY)
Wirtz, C.
Sitzungsberichte der Akademie der Wissenschaften, Mathematisch-naturwissenschafliche Klasse, Abteilung IIa, Vienna, v. 141, pp. 163–172, 1932
(*AJ*, 1932, #5802)

533. ZUR FRAGE DER HELLIGKEIT DES SATURN-RINGES (ON THE QUESTION OF THE BRIGHTNESS OF SATURN'S RING)
Vsesviatsky, S.
Astronomische Nachrichten, v. 236, p. 95, 1929
(*AJ*, 1929, #5806)

Microphotometric results are presented for seven pictures taken on August 24, 1928.

534. OBSERVATIONS OF SATURN'S RING MADE WITH LIGHT FILTERS
Mitin, M. N.
Mirovedenie, no. 4, 1929 (in Russian)
(*AJ*, 1929, #5806a)

The article discusses the brightness and color of the ring.

535. PHOTOMETRICAL OBSERVATIONS OF SATURN IN 1927
Fesenkov, V. G.
Astronomische Nachrichten, v. 231, pp. 9–12, 1927
(*AJ*, 1927, #5805)

A comparison is made of the brightness of the edges of the rings with that in the center of the planet's disc.

536. PHOTOMETRICAL OBSERVATIONS OF THE PLANET SATURN IN 1926
Fesenkov, V. G.
Astronomische Nachrichten, v. 229, p. 227, 1927
(*AJ*, 1927, #5805)

A comparison is made of the brightness at the edge of Saturn's ring with that in the center of the disc.

537. PHOTOMETRIC OBSERVATIONS OF THE PLANET SATURN
Fesenkov, V. G.
Astronomische Nachrichten, v. 226, pp. 127–128, 1925
(*AJ*, 1925, #5802)

A comparison is made of the brightness at the center of the disc with that of the outer edges of the ring; it is found that the eastern edge is brighter than the western one.

URANUS, NEPTUNE, AND PLUTO

Reports

538. PHOTOELECTRIC MAGNITUDES AND COLOR OF URANUS
Giclas, H. L.
Paper presented at the 89th AAS Meeting, Boulder, Colo., August 26–30, 1953
American Astronomical Society, Inc., New York, N.Y.
(Abstracted in *Astronomical Journal*, v. 58, p. 215, 1953)

The brightness of Uranus was observed photoelectrically in three colors on 46 nights during the oppositions of 1950, 1951, and 1952 with a conventional IP21 photomultiplier photometer attached to the Cassegrain focus of the Lowell 42-in. reflector. The approximate effective wavelengths for the three colors are: 3750 Å for the violet; 4550 Å for the blue; and 5250 Å for the yellow. Two color indexes, yellow-blue and yellow-violet, and a yellow magnitude were derived from the mean of each night of observation.

Periodicals

539. THE ALBEDOS AND PHASE VARIATIONS OF URANUS AND NEPTUNE
Sinton, W. M.
Lowell Observatory, Bulletin of the, v. 4, no. 7, pp. 92–97, 1959

Photoelectric observations made in 1953 at the Lowell Observatory to verify the variations of phase calculated by R. L. Tally and H. G. Horak are discussed, and values of the albedos in the U, B, V system are given.

540. PHOTOELECTRIC OBSERVATIONS OF URANUS AND NEPTUNE
Mitchell, R. I.
Astronomical Society of the Pacific, Publications of the, v. 69, pp. 565–568, 1957 (Notes)

Photoelectric observations of Uranus and Neptune have been made for the purpose of detecting possible variations in the light radiated by the Sun and reflected from these planets.

541. THE PHASE VARIATION OF URANUS
Talley, R. L., Horak, H. G.
Astrophysical Journal, v. 123, pp. 176–177, 1956 (Notes)

542. A PHOTOMETRIC DETERMINATION OF THE ROTATIONAL PERIOD OF PLUTO
Walker, M. F., Hardie, R.
Astronomical Society of the Pacific, Publications of the, v. 67, pp. 224–231, 1955
(*AJ*, 1955, #7816)

The rotation period of Pluto is determined at 6.390 ±0.003 d from photoelectric brightness measurements made in 1955, combined with similar data from 1953 and 1954. The brightness-variation amplitude is 0.1 mag. The fact that the observations of three different years fit one light curve indicates that it is not a cloud layer but the actual surface which is being observed.

543. THE VISUAL MAGNITUDE OF URANUS
Holborn, F. M.
British Astronomical Association, Journal of the, v. 65, pp. 284–285, 1955
(*AJ*, 1955, #7803)

From 12 estimates made in 1953–1954, the average visual brightness of the planet Uranus at mean opposition is derived at 5.47 mag.

544. THE VISUAL MAGNITUDE OF URANUS
Nielsen, A. V.
British Astronomical Association, Journal of the, v. 65, pp. 283–284, 1955
(*AJ*, 1955, #7804)

Forty-three estimates of the visual brightness of Uranus by S. Kierulff in 1937–1950 give 5.53 ± 0.015 mag (m.F.) as the average brightness, reduced to the average opposition. The average observation time is 1942.98.

545. BRIGHTNESS OF PLUTO
Sky and Telescope, v. 14, p. 20, 1955
(*AJ*, 1954, #7813)

546. PHOTOELECTRIC MAGNITUDES AND COLORS OF URANUS
Giclas, H. L.
Astronomical Journal, v. 59, no. 1215, pp. 128–131, April 1954

The brightness of Uranus was observed photoelectrically in three colors on 46 nights during the opposition of 1950, 1951, and 1952. The details of observation and reduction are described. The results show that the variation in brightness of Uranus over the whole period is restricted to less than 0.01 mag. No short-period variation ascribable to the rotation of the planet was detected. The difference in mean brightness of Uranus now as compared to the value obtained photoelectrically by Stebbins in 1927 is less than 0.08 mag. Reduction on the photoelectric system of Johnson and Morgan is given. Comparison has been made with concurrent values of the solar constant and magnetic activity of the Sun, but no correlation between the small fluctuations in each is found.

547. PHOTOELECTRIC MAGNITUDES AND COLOR OF URANUS
Giclas, H. L.
Astronomical Journal, v. 58, p. 215, 1953
(*AJ*, 1953, #7803)

548. DER ROTATIONSLICHTWECHSEL DES NEPTUN (THE ROTATIONAL LIGHT VARIATION OF NEPTUNE)
Günther, O.
Mitteilungen der astronomischen Gesellschaft, p. 20, 1953
(*AJ*, 1954, #7809)

549. PHOTOMETRY OF THE PLANET URANUS
Roth, G. D.
Vega, no. 1, pp. 2–3, 1953
(*AJ*, 1953, #7804)

550. DIE PHOTOMETRISCHEN VERHÄLTNISSE DES PLANETEN URANUS (PHOTOMETRIC RATIOS OF URANUS)
Neis, K.
Die Sterne, v. 28, pp. 142–147, 1952
(*AJ*, 1952, #7804)

Observations of the brightness made during the 1948–1950 oppositions are discussed.

551. RÉSULTATS D'OBSERVATIONS PHOTOMÉTRIQUES. NEPTUNE 1949, 1950 (RESULTS OF PHOTOMETRIC OBSERVATIONS. NEPTUNE 1949, 1950)
Bajocchi, R., Haas, W. H., du Martheray, M., et al.
Documentation des observateurs, Paris, bulletin 5, v. 4, fasc. 3, p. 1, 1951
(*AJ*, 1951)

552. PHOTOELECTRIC PHOTOMETRY OF URANUS AND NEPTUNE
Kameny, F. E.
Astronomical Journal, v. 55, p. 172, 1950
(*AJ*, 1950, #7803)

553. RÉSULTATS D'OBSERVATIONS PHOTOMÉTRIQUES. URANUS (RESULTS OF PHOTOMETRIC OBSERVATIONS. URANUS)
Antonini, E., Bajocchi, R., Haas, W. H., et al.
Documentation des observateurs, Paris, pp. 6–7, 1950
(*AJ*, 1950, #7802)

554. NEW MEASUREMENTS OF NEPTUNE'S DIAMETER
Himmelfarb, B. N.
Priroda, v. 39, no. 9, p. 43, 1950 (in Russian)
(*AJ*, 1950, #7807)

555. DIE OPPOSITIONSHELLIGKEIT DES URANUS 1949/1950 (THE OPPOSITION BRIGHTNESS OF URANUS 1949–1950)
Malsch, W.
Die Sterne, v. 26, p. 126, 1950
(*AJ*, 1950)

556. VARIATIONS IN THE BRIGHTNESS OF URANUS
Ashbrook, J.
Astronomical Society of the Pacific, Publications of the, v. 60, pp. 116–118, 1948
(*AJ*, 1948, #7803)

Observations made with binoculars between 1936 and 1947 confirm the period of opposition brightness of about eight years determined earlier. The amplitude amounts to 0.4 mag. The last minimum occurred toward the end of 1944.

557. FARBZAHLEN VON URANUS, NEPTUN UND VESTA (COLOR INDEXES OF URANUS, NEPTUNE, AND VESTA)
Weltall, v. 42, pp. 90–91, 1942
(*AJ*, 1942, #5902)

558. INDICE DI COLORE DEI PIANETI URANO, NETTUNO, VESTA (COLOR INDEXES OF THE PLANETS URANUS, NEPTUNE, AND VESTA)
Gialanella, L.
Astronomische Nachrichten, v. 271, pp. 284–285, 1941
(*AJ*, 1941, #5902)

559. INDICE DI COLORE DEL PIANETA URANO. OSSERVAZIONI FOTOMETRICHE E INDICE DI COLORE DEL NUCLEO DELLA COMETA KOZIK-PELTIER, 1939*a* (COLOR INDEX OF THE PLANET URANUS. PHOTOMETRIC OBSERVATIONS AND COLOR INDEX OF THE NUCLEUS OF THE COMET KOZIK-PELTIER, 1939*a*)
Gialanella, L.
Atti della accademia nazionale dei Lincei, Rendiconti, Classe di scienza fisiche, matematiche e naturali, (6a), v. 29, pp. 198–204, 1939
(*AJ*, 1939, #5904)

Thirteen color indexes of Uranus and their average, obtained with the Töpfer photometer and with color filters, are presented, followed by three locations, eight color-index values, and eleven brightness values for the comet 1939*a* and a discussion of the results of these observations.

560. ÜBER DIE HELLIGKEIT DES URANUS IN DEN JAHREN 1935/37 (THE BRIGHTNESS OF URANUS IN 1935–1937)
Fedtke, C.
Die Sterne, v. 17, pp. 213–214, 1937
(*AJ*, 1937, #5902)

561. HELLIGKEIT UND FÄRBUNG DER WALLEBENE PLATO (BRIGHTNESS AND COLORATION OF THE CRATER PLATO)
Güssow, K., Kaiser, H. K.
Die Sterne, v. 17, pp. 91–92, 1937
(*AJ*, 1937, #5454)

562. PHOTOMETRIC OBSERVATIONS OF URANUS, 1916–1918
Campbell, L.
Harvard College Observatory Bulletin, no. 904, pp. 32–35, 1936
(*AJ*, 1936, #5904)

563. PHOTOMETRIC OBSERVATIONS OF URANUS, 1929–30
Goddard, R. H.
Astronomical Journal, v. 40, p. 98, 1930
(*AJ*, 1930, #5904)

564. HELLIGKEIT DES PLUTO (BRIGHTNESS OF PLUTO)
Graff, K.
Astronomische Nachrichten, v. 240, p. 163, 1930
(*AJ*, 1930, #6007)

565. DIE HELLIGKEIT DES URANUS IN DEN OPPOSITIONEN 1928–1929 UND 1929–1930 (THE BRIGHTNESS OF URANUS DURING THE OPPOSITION OF 1928–1929 AND 1929–1930)
Becker, W.
Astronomische Nachrichten, v. 239, pp. 19–22, 1930
(*AJ*, 1930, #5903)

566. LICHTELEKTRISCHE BEOBACHTUNGEN DER PLANETEN URANUS UND JUPITER (PHOTOELECTRIC OBSERVATIONS OF THE PLANETS URANUS AND JUPITER)
Güssow, M.
Astronomische Nachrichten, v. 237, pp. 229-230, 1929
(*AJ*, 1929, #5717)

567. DIE HELLIGKEIT DES URANUS IN DEN OPPOSITIONEN 1920–27 (THE BRIGHTNESS OF URANUS DURING THE OPPOSITIONS OF 1920–1927)
Becker, W.
Astronomische Nachrichten, v. 235, pp. 85–90, 1929
(*AJ*, 1929, #5904)

The study confirms the short-period light variations noted by Campbell. In addition, longer fluctuations appear; however, there is not sufficient material for their investigation.

568. A PHOTOMETRIC STUDY OF URANUS
Slavenas, P.
Astronomische Nachrichten, v. 233, pp. 125–126, 1928
(*AJ*, 1928, #5903)

Photographic photometrically recorded contacts of Uranus with 13 Ceti indicate a periodicity of 0.4497 day, which comes very close to the rotation period determined spectroscopically by Slipher and Lowell.

569. TESTS OF THE SOLAR VARIATION BY PHOTOMETRIC MEASURES OF URANUS
Stebbins, J., Jacobsen, T. S.
Popular Astronomy, v. 35, p. 494, 1927
(*AJ*, 1927, #4506)

570. OSSERVAZIONI FOTOMETRICHE DI NETTUNO (PHOTOMETRIC OBSERVATIONS OF NEPTUNE)
Armellini, G.
Astronomische Nachrichten, v. 228, pp. 295-296, 1926
(*AJ*, 1926)

Observations made from March to May 1926 are presented.

571. HELLIGKEIT UND ABPLATTUNG DES URANUS (THE BRIGHTNESS AND OBLATENESS OF URANUS)
Wirtz, C.
Astronomische Nachrichten, v. 227, pp. 273–276, 1926
(*AJ*, 1926, #5902)

The oblateness of Uranus implies the existence of light maxima and minima. The following points are discussed: proof of their occurrence given in 1861, 1882, 1903, 1924; uniform re-adaptations of early and more recent observations; comparisons with the Lambert and Lommel-Seeliger photometric law; assumption of an oblateness of approximately 1/10; micrometric measurements and their difficulties; and qualitative significance of the brightness observations with respect to the oblateness.

VENUS

Reports

572. POLARIZATION OF LIGHT FROM THE MOON, MARS, VENUS, AND NGC 7023
Gehrels, T.
Paper presented at the 103rd AAS Meeting, Toronto, Canada, August 30–September 2, 1959
American Astronomical Society, Inc., New York, N. Y.
(Abstracted in *Astronomical Journal*, v. 64, p. 332, October 1959)

573. PHOTOGRAPHIC PHOTOMETRY OF VENUS
Yezerski, V. I.
1956
Kharkov, University of, USSR
Thesis (in Russian)

Periodicals

574. RADIOMETRIC OBSERVATIONS OF VENUS
Sinton, W. M., Strong, J.
Astrophysical Journal, v. 131, pp. 470–490, March 1960

Modern infrared techniques were applied to the measurement of thermal radiation and temperatures of planets. (*PA*, 1960, #6573)

575. REMARKS ON MARS AND VENUS
de Vaucouleurs, G.
Journal of Geophysical Research, v. 64, no. 11, pp. 1739–1744, November 1959

The significant astronomical and astrophysical facts, together with the rather fragmentary geophysical data for the two planets, are reviewed. These include tabulated information on: (1) orbital elements; (2) physical elements; (3) atmospheric conditions; (4) planetary temperatures (black-body, gray-body, and radiometric) and densities. Recent research on the Venusian clouds and the new infrared absorption bands in the Martian atmosphere are discussed. (*PA*, 1960, #10493)

576. THE ABSOLUTE PHOTOMETRY OF VENUS IN THE ULTRAVIOLET AND INFRARED
Koval, I. K.
Astronomicheskii Zhurnal, v. 35, pp. 792–796, 1958 (in Russian with English abstract)
(*AJ*, 1958, #7114)

Methods and results of photographic observations of Venus made by absolute photometry are discussed. These results were obtained by the author in August 1956 with the 270-mm reflector of the Kharkov Astronomical Observatory, using ultraviolet and infrared filters. The results are summarized in several tables.

577. SPECTROSCOPIC OBSERVATIONS OF VENUS FOR ROTATION MADE AT MOUNT WILSON IN 1956
Richardson, R. S.
British Interplanetary Society, Journal of the, v. 16, pp. 517–524, 1958
(See also *Publications of the Astronomical Society of the Pacific*, v. 70, pp. 251–260, 1958)
(*AJ*, 1958, #7124)

In the spring and fall of 1956, a total of 30 diffraction spectrograms of Venus were taken with the Snow-Telescope (dispersion 0.84 Å/mm) in the Coudé focus of the 100-in. telescope (dispersion 2.8 and 2.7 Å/mm). Usually 13 solar and 17 atmospheric lines were measured in each region at λ 6300; in five spectograms only, 15 solar lines and 18 iron-arc lines were used. Spectrographic determinations of the rotation velocity of the Sun and Mars made for control purposes showed good agreement with known values. The rotation direction of Venus was not clearly determinable. A short period of rotation seems impossible. A period of 13 days as indicated by radio observations made by Kraus could be correct.

578. ASHEN LIGHT OF VENUS
Sky and Telescope, v. 17, p. 123, 1958
(*AJ*, 1958, #7127)

579. DETERMINING THE INSTANT OF GREATEST BRIGHTNESS OF VENUS
Nikolayev, S. P.
Vsesoiuznoe astronomo-geodezicheskoe obshchestvo, Biulleten, no. 23, pp. 55–56, 1958 (in Russian)
(*AJ*, 1958, #7122)

580. LA COULEUR DE VÉNUS ET LA NATURE DE SES NUAGES (THE COLOR OF VENUS AND THE NATURE OF HER CLOUDS)
Link, F., Neužil, L.
Astronomical Institutes of Czechoslovakia, Bulletin of the, v. 8, pp. 23–37, 1957
(*AJ*, 1957, #7123)

A comparison is made of the colors of Venus and the Sun from observations made at Lomnický Štít with a Link photometer in three spectral regions. The measurements show that the color of Venus contains more yellow than that of the Sun. It can hardly be assumed that the clouds of the Venus atmosphere resemble terrestrial clouds.

581. PHOTOGRAPHIC PHOTOMETRY OF VENUS
Yezerski, V. I.
***Kharkov Universitet, Astronomicheskaia observatoriia, Trudy*, v. 12, pp. 73–165, 1957 (in Russian); *Uchenye Zapiski*, v. 91, pp. 73–165, 1957**
(*AJ*, 1957, #7121)

The following selections comprise the numerous paragraphs into which the comprehensive monograph is subdivided: Summary of the Works on Venus Photometry; Investigation of the Brightness Distribution on the Venus Disc; Discussion of the Results.

582. CALCULATIONS OF THE TWILIGHT GLOW OF VENUS FOR A THREE-LAYER ATMOSPHERIC MODEL
Frolov, V. N.
***Leningrad Universitet, Uchenye Zapiski*, no. 190, Math. no. 29, pp. 62–73, 1957 (in Russian); *Astronomicheskaia observatoriia, Trudy*, v. 17, pp. 62–73, 1957**
(*AJ*, 1957, #7117)

The contradiction between the low horizontal-refraction value for Venus as computed from the Lomonosov effect, and the expected value of the twilight glow led Sharonov to the hypothesis of a transparent atmosphere with an opaque cloud layer at a certain altitude. Making certain simplifying assumptions, the author has calculated the twilight brightness for this hypothesis. Comparison with the observations indicates an altitude of 500–700 km for the opaque layer, which is improbable. The author intends to compute another atmospheric model for Venus.

583. THE PROBLEM OF VISUAL OBSERVATIONS OF VENUS
Ashbrook, J.
***Sky and Telescope*, v. 16, pp. 588–589, 1957**

584. VISUAL COLORIMETRY OF VENUS AT WESTERN ELONGATION IN 1956
Sharonov, V. V.
***Astronomicheskii Tsirkuliar*, no. 174, pp. 10–11, 1956 (in Russian)**
(*AJ*, 1956, #7128)

Measurements made in August–September 1956, with a Rosenberg blue-wedge astrophotometer at the tube telescope of the Tashkend normal astrophotometer, yielded an average difference color index between Venus and the Sun of 0.12 mag. Extrafocal observations were made of Venus, and reflection from a mat surface was used as the solar observation method.

585. THREE-COLOUR PHOTOMETRY OF VENUS
***British Astronomical Association, Journal of the*, v. 66, pp. 166–169, 1956**

586. A PRELIMINARY NOTE ON THE PHOTOMETRY OF THE DARK OR NIGHT HEMISPHERE OF THE PLANET VENUS
Baum, R. M.
***Strolling Astronomer*, v. 10, pp. 11–13, 1956**
(*AJ*, 1956, #7107)

The night side of Venus has been described as partially brighter, partially darker than the surrounding celestial background. This phenomenon, which appears to have a phase cycle, is explained as an optical contrast effect on the one hand; on the other hand, the possibility of luminescence of ionized masses in the upper layers of the atmosphere is noted.

587. TEMPERATURES ON THE BRIGHT AND DARK SIDES OF VENUS
Pettit, E., Nicholson, S. B.
***Astronomical Society of the Pacific, Publications of the*, v. 67, pp. 293–303, 1955**
(*AJ*, 1955, #7132)

The technique of measuring radiation is described, especially with respect to its use for determining the temperature of Venus in the years 1923–1928. Several thermoelements were used as radiation detectors, with a (microscope) glass cover serving as a filter for the separation of visible and infrared light. After a description of the reduction process, temperature tables are presented for the bright (day) and the dark (night) sides of Venus. Both average about 240°K.

588. VISUAL COLORIMETRIC OBSERVATIONS OF VENUS IN 1954
Sharonov, V. V.
Astronomicheskii Tsirkuliar, no. 161, pp. 12–13, 1955 (in Russian)
(*AJ*, 1955, #7113)

An average color index of 0.09 mag relative to the Sun was determined between May and July.

589. ÉTUDE VISUELLE ET PHOTOGRAPHIQUE DE L'ATMOSPHÈRE DE VÉNUS (VISUAL AND PHOTOGRAPHIC STUDY OF THE ATMOSPHERE OF VENUS)
Dollfus, A.
L'Astronomie, v. 69, pp. 413–425, 1955
(*AJ*, 1955, #7118)

This paper discusses the visual and photographic observations of Venus collected by the author over a period of six years. Several instruments, with apertures from 5 to 60 cm, were used. A rotational period equal to the 225-day period of revolution is assumed on the basis of the dark shadings on the planet's disc. The details in three spectral regions (yellow, blue and ultraviolet) are essentially alike.

590. THE RADIAL MARKINGS OF VENUS: A REJOINDER
Baum, R. M.
Strolling Astronomer, v. 9, pp. 82–91, 1955
(*AJ*, 1955, #7116)

After a general survey of the uncertainty concerning the bands and spots observed on Venus, the author refers to laboratory experiments and to photographs of Venus in the ultraviolet taken by Ross (1927) which indicate the actual existence of the spokelike markings.

591. THE RADIAL MARKINGS OF VENUS AND THEIR MODERN RESURRECTION
Bartlett, J. C., Jr.
Strolling Astronomer, v. 9, pp. 2–8, 1955
(*AJ*, 1955, #7115)

The following conclusions are drawn from a discussion of the physical observations of various origins: (1) Linear markings do exist on the Venus disc. (2) Some faded dark spots appear, most of which are distinguishable from the surroundings only by small differences in color and albedo. (3) At least some of the representatives of both types are permanent. (4) The observer will discern one or the other type of drawing more readily, depending upon his color sensitivity.

592. THE MOLECULAR ABSORPTION IN THE VIOLET PORTION OF THE VENUS SPECTRUM
Kozyrev, N. A.
Akademiia nauk SSSR, Krymskaia astrofizicheskaia observatoriia, Izvestiia, v. 12, pp. 177–181, 1954 (in Russian)
(*AJ*, 1954, #7126)

Using spectrograms of Venus made with the 50-in. Crimean Observatory reflector, a comparison was made of the spectra of Venus and the Sun in the λ 3800-6500 Å region. It is almost impossible to determine absorption in the red light of the Venusian atmosphere. The absorption increases in the direction of shorter wavelengths up to 0.5 mag at λ 4540 Å, and then rises rapidly to 1.5 mag at λ 3800 Å. The molecular origin of the violet absorption in the Venus spectrum is explained by two bands at λ 4372 and 4120 Å. The multiatomic molecule plays the same part in the Venusian atmosphere as water vapor does on the Earth.

593. THE LUMINOSITY OF THE NIGHT SKY OF VENUS
Kozyrev, N. A.
Akademiia nauk SSSR, Krymskaia astrofizicheskaia observatoriia, Izvestiia, v. 12, pp. 169–176, 1954 (in Russian)
(*AJ*, 1954, #7125)

In March 1953, pictures which showed the emission spectrum of the dark edge of Venus were taken with a quartz spectrograph at the 50-ft reflector of the Crimean Observatory (dispersion of 150 Å/mm at H γ). Emission bands λ 3914 and 4278 Å of the N_2^+ molecule, characteristic of the polar luminescence, indicate an absolute brightness of 10^{-2} erg/cm^2 sec. The second positive group of N_2 also seems to be present, whereas the Vegard-Kaplan system is lacking. The glow of nitrogen molecules in the night sky of Venus corresponds to the Aurora Borealis but not to the night-sky luminescence of the Earth. In comparison with the night-sky brightness of the Earth, it is approximately 50 times as strong, which corresponds to about 1/5 of the night-sky brightness by full Moon.

594. ABSOLUTE PHOTOMETRY OF VENUS
Parshin, I. A.
Leningrad Universitet, Vestnik, v. 9, no. 5, pp. 85–95, 1954 (in Russian)
(*AJ*, 1954, #7131)

595. COLORIMETRIC OBSERVATIONS OF VENUS AND JUPITER
Sharonov, V. V.
Astronomicheskii Tsirkuliar, no. 138, p. 7, 1953 (in Russian)
(*AJ*, 1953)

596. OBSERVATION VISUELLE ET PHOTOGRAPHIQUE DES PLANÈTES MERCURE ET VÉNUS À L'OBSERVATOIRE DU PIC DU MIDI (VISUAL AND PHOTOGRAPHIC OBSERVATION OF THE PLANETS MERCURY AND VENUS AT THE PIC DU MIDI OBSERVATORY)
Dollfus, A.
L'Astronomie, v. 67, pp. 61–75, 1953
(*AJ*, 1953)

597. DETERMINATION OF THE HORIZONTAL REFRACTION IN THE ATMOSPHERE OF VENUS FROM OBSERVATIONS OF THE LOMONOSOV EFFECT
Sharonov, V. V.
Akademiia nauk SSSR, Doklady, v. 82 pp. 351–353, 1952 (in Russian)
(*AJ*, 1952, #7112)

The observation of the brightening of portions of the Venus disc which have not yet contacted the solar disc at the beginning of the Venusian transit is used to estimate the horizontal refraction, which is found to be about 20 min.

598. THE PROBABLE STRUCTURE OF THE ATMOSPHERE OF VENUS
Sharonov, V. V.
Astronomicheskii Tsirkuliar, no. 125, pp. 8–9, 1952 (in Russian)
(*AJ*, 1952, #7111)

The contradiction between the magnitude of the Venusian atmosphere, with its relatively small horizontal refraction on the one hand, and the considerable extension of the tips of the crescent on the other, can be resolved by the hypothesis that the visible surface of Venus is a thin, semitransparent cloud layer, which is separated from the actual surface of the planet, or the opaque cloud layers, by a layer of nontransparent gas of considerable geometric depth.

599. CHANGES IN THE COLOR INDEX OF VENUS
Barabashov, N. P., Chekirda, A. T.
Kharkov Universitet, Astronomicheskaia observatoriia, Trudy, v. 2 (10), pp. 5–7 (in Russian); *Uchenye Zapiski*, v. 42, pp. 5–7, 1952
(*AJ*, 1952, #7109)

Comparison of photographic brightnesses obtained by King and visual brightnesses by Müller and Danjon shows that the color indexes derived from them are practically constant to phase angles of approximately 75 deg. Then, however, they decrease rapidly to 165 deg. This blue effect of Venus is compensated to a large extent by the reddening of the Venus light in the Earth's atmosphere, because at small elongations the observations take place only at low elevations. The blue coloration at large phase angles is confirmed by the small spectra obtained with the aid of a small objective-prism camera at Kharkov. The origin of this phenomenon remains uncertain.

600. PHOTOMETRISCHER VERGLEICH DER DÄMMERUNGSERSCHEINUNGEN DER ERDE UND DER VENUS (PHOTOMETRIC COMPARISON OF THE TWILIGHT GLOW OF THE EARTH AND OF VENUS)
Sharonov, V. V.
Astronomicheskii Zhurnal, v. 28, pp. 382–387, 1951 (in Russian)
(*AJ*, 1951, #7123)

601. ÜBER DIE ROLLE DER LICHTSTREUUNG IN DER VENUSATMOSPHÄRE (THE ROLE OF LIGHT SCATTERING IN THE ATMOSPHERE OF VENUS)
Shingariov, L. I.
Kharkov Universitet, Astronomicheskaia observatoriia, Trudy, v. 1(9), p. 73, 1951 (in Russian)
(*AJ*, 1951, #7124)

602. ÜBER DIE VERLÄNGERUNG DER HÖRNERSPITZEN DER VENUSSICHEL (THE EXTENSION OF THE POINTS OF THE VENUS CRESCENT)
Barabashov, N. P.
Kharkov Universitet, Astronomicheskaia observatoriia, Trudy, v. 1(9), pp. 7–8, 1951 (in Russian)
(*AJ*, 1951, #7115)

603. PHOTOMETRY OF VENUS
Barabashov, N. P., Yezerski, V. I.
Akademiia nauk Kazakhskoi SSR, Izvestiia, seriia astrobotanicheskaia, no. 90, pp. 36–52, 1950 (in Russian)
(*AJ*, 1950, #7109)

604. PHOTOMÉTRIE ET COLORIMÉTRIE DES PLANÈTES MERCURE ET VÉNUS (PHOTOMETRY AND COLORIMETRY OF THE PLANETS MERCURY AND VENUS)
Danjon, A.
Bulletin astronomique, v. 15, p. 105, 1950
(*AJ*, 1950, #7103)

On the basis of an improved solar brightness value of −26.86 mag, values of 0.055 for the visual albedo of Mercury and 0.64 for Venus are derived.

605. ALBEDOS DES PLANÈTES MERCURE ET VÉNUS; VALEURS CORRIGÉES (ALBEDOS OF THE PLANETS MERCURY AND VENUS; CORRECTED VALUES)
Danjon, A.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 230, p. 1011, 1950
(*AJ*, 1950, #7104)

606. NEW DATA ON THE PHYSICAL CONDITIONS ON VENUS
Rubashev, V. M.
Priroda, v. 39, no. 11, pp. 37–38, 1950 (in Russian)
(*AJ*, 1950, #7113)

607. LA VISIBILIDAD DEL HEMISFERIO OSCURO DE VENUS (THE VISIBILITY OF THE DARK HEMISPHERE OF VENUS)
Haas, W. H.
Urania. Revista de Astronomia y Ciencias Afines, Barcelona, v. 35, pp. 151–157, 1950
(*AJ*, 1950, #7111)

Noble's interpretation of the "ash-gray light" of Venus as the silhouette of the planet on a background created by the zodiacal light or the outer solar corona does not explain the discrepancies between observations. Therefore, it is assumed in this article that the brightening of the outer planetary atmosphere due to the Sun is partially responsible for the phenomenon, as is the case with the terrestrial night-sky light or the luminescent nocturnal clouds.

608. REFRAKTION UND DÄMMERUNGSBOGEN DES PLANETEN VENUS (REFRACTION AND THE TWILIGHT ARCH OF THE PLANET VENUS)
Schoenberg, E.
Astronomische Nachrichten, v. 277, pp. 123–128, 1949
(*AJ*, 1949, #7110)

It is shown that for the lower layers of the Venus atmosphere, diffusion and refraction are inseparable, and that even at large horizontal-refraction values (65–70″) and the old diffusion-constant values, the conclusion that carbon dioxide is the main constituent of the Venus atmosphere is mandatory. For the upper atmospheric layers, which become visible against a dark celestial background, the refraction can be neglected and the altitude of the layer determined.

609. COLORIMETRIC OBSERVATIONS OF VENUS AND SOME OTHER OBJECTS
Sharonov, V. V.
Astronomicheskii Tsirkuliar, no. 81, p. 9, 1948 (in Russian)
(*AJ*, 1948, #7302)

610. TABLE FOR THE BRIGHTNESS DETERMINATION OF THE PLANET VENUS
Horka, K.
Říše Hvězd, v. 29, p. 153, 1948 (in Czechoslovakian)
(*AJ*, 1948, #7108)

611. LA DÉCOUVERTE DE LA LUMIÈRE CENDRÉE DE VÉNUS (THE DISCOVERY OF THE ASH-GRAY LIGHT ON VENUS)
Humbert, P.
Ciel et terre, v. 56, pp. 41–43, 1940
(*AJ*, 1940, #5218)

It is shown by means of a previously unpublished letter by Peiresc, dated March 6, 1611, that Nicolas-Claude Fabri de Peiresc (1580–1637) should be credited with the original discovery of the ash-gray light on Venus.

612. PHOTOMÉTRIE DES PLANÈTES MERCURE ET VÉNUS (PHOTOMETRY OF THE PLANETS MERCURY AND VENUS)
Danjon, A.
Journal de physique et le radium, v. 10 (7), pp. 112–113, 1939
(*AJ*, 1939, #5201)

613. OBSERVATIONS COLORIMÉTRIQUE DE MARS ET VÉNUS (COLORIMETRIC OBSERVATIONS OF MARS AND VENUS)
Oriano, G.
L'Astronomie, v. 52, pp. 400–404, 1938
(*AJ*, 1938, #5212)

Color estimates are presented of Mars and Venus during the conjunction of May 1938.

614. RECHERCHE DE LA LUMIÈRE CENDRÉE DE VÉNUS PENDANT LA CONJONCTION INFÉRIÈRE DE 1935 (RESEARCH ON THE ASH-GRAY LIGHT OF VENUS DURING THE INFERIOR CONJUNCTION OF 1935)
Barbier, D.
L'Astronomie, v. 50, pp. 27–32, 1936
(*AJ*, 1936, #5212)

615. ÉTUDES PHOTOMÉTRIQUES DE VÉNUS (PHOTOMETRIC STUDIES OF VENUS)
Barabashov, N. P., Semeykin, B. E.
Kharkov Universitet, Astronomicheskaia observatoriia, Publikatsii, no. 5, pp. 29–37, 1936
(in Russian and French)
(*AJ*, 1936, #5211)

616. DIE REFRACTIONS- UND DIE DIFFUSIONSKONSTANTE DER VENUSATMOSPHÄRE (DIFFRACTION AND DIFFUSION CONSTANTS OF THE ATMOSPHERE OF VENUS)
Schoenberg, E.
Sitzungsberichte der preussischen Akademie der Wissenschaften, physikalisch-mathematische Klasse, no. 21, 1933
(*AJ*, 1933, #5208)

The horizontal refraction of Venus can be determined from the extension of the crescent tips. From this, and the measured light-diffusion of Venus and the Earth, the gas which is the main constituent of the Venusian atmosphere can be ascertained. It is carbon dioxide.

617. BEOBACHTUNGEN DER HELLIGKEITS-VERTEILUNG AUF DER VENUSSCHEIBE (OBSERVATIONS OF THE BRIGHTNESS DISTRIBUTION ON THE DISC OF VENUS)
Schoenberg, E.
Mitteilungen der Universitäts-Sternwarte zu Breslau, v. 3, pp. 35–48, 1932
(*AJ*, 1932, #5206)

This article contains detailed observations, the results of which were reported earlier in the *Sitzungsberichte der preussischen Akademie der Wissenschaften, physikalisch-mathematische Klasse*, no. 21, 1931.

618. UNTERSUCHUNGEN ÜBER DIE ATMOSPHÄRE DES PLANETEN VENUS (STUDIES OF THE ATMOSPHERE OF VENUS)
Schoenberg, E.
Sitzungsberichte der preussischen Akademie der Wissenschaften, physikalisch-mathematische Klasse, pp. 383–416, 1931
(*AJ*, 1931, #5206)

The brightness distribution of the disc for phase angles of 40 to 125 deg was determined from observations made in 1916–1918 and 1927–1929, using a surface photometer and color filters. From these data, conclusions were reached by theoretical means concerning the composition of the Venusian atmosphere.

619. RECENT INVESTIGATIONS OF THE PHYSICAL NATURE OF VENUS. BUDAPEST 1930
von Harkanyi, B.
Stella-Almanach, v. 6, pp. 181–187, 1930
(in Hungarian)
(*AJ*, 1930, #5214)

The article discusses the recent investigations made by F. E. Ross.

620. PHOTOMETRIC INVESTIGATIONS OF THE BRIGHTNESS DISTRIBUTION ON THE DISC OF VENUS
Barabashov, N. P.
Kharkov Universitet, Astronomicheskaia observatoriia, Publikatsii, v. 2, pp. 3–11, 1928 (in Russian)
(***AJ***, 1928, #5224)

The article discusses observations of Venus made by the author in the years 1920–1923, using the 6-in. refractor at the Kharkov Observatory. A device containing a photometric wedge was attached to the eyepiece. The following observation method was used: At various positions of the wedge, the duration of the transition of the visible Venus disc through the edge of an opaque plate fastened to the focal plane was determined. In 1923, two color filters (red and green) were utilized for the observations.

621. PHOTOMETRISCHE TAGESBEOBACHTUNGEN DES PLANETEN VENUS VON G. MÜLLER (PHOTOMETRIC DAYTIME OBSERVATIONS OF THE PLANET VENUS BY G. MÜLLER)
Müller, R.
Astronomische Nachrichten, v. 227, pp. 65–72, 1926
(***AJ***, 1926, #5210)

The observations of Venus made by G. Müller cover the period from 1900 to 1909. They were all made at the planet's greatest elongation, taking certain precautionary measures as described in the introduction, and include phase angles from 2 to 168 deg. The new, very reliable light curve cannot be plotted using either the Lambert or the Seeliger illumination law. A value of 0.57 is found for the albedos, which agrees approximately with the value of 0.59 computed by Russell (from G. Müller's earlier observations) in *The Astrophysical Journal*, v. 43, 1916. The author deals with the same subject in *Die Sterne*, v. 6, pp. 1–9, 1926.

622. POLARISATION DE LA PLANÈTE VÉNUS (POLARIZATION OF THE PLANET VENUS)
Lyot, B.
Comptes rendus hebdomadaires des séances de l'académie des sciences, v. 182, pp. 265–269, 1926
(***AJ***, 1926, #5215)

The polarization phenomena discovered are explained by the presence in the atmosphere of water droplets 4.5 μ in size.

AUTHOR INDEX